BANGKOK OFFICE OVERSUPPLY MARKET: WHAT SHOULD REAL ESTATE COMPANIES DO?

by

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Piyaporn Ann Phanachet
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A B S T R A C T

The office market in the Bangkok Metropolitan area is entering an overbuilt stage, as indicated by an enormous amount of office space which will enter the market between 1993 and 1995 and double the existing supply of office space. What will happen to vacancy rate? How long the overbuilt market will last? What should developers do to survive a extraordinary high vacancy rate? and What type of office space is most desired by tenants'?

This thesis examined demand-supply analysis. Hedonic model of rent and questionnaire are used to help real estate professionals learn about what tenants need.

The results expect the market to recover anytime between 1997 and 2001. The vacancy rate is unikely to be higher than 36%. Examined in three scenarios: mild, medium, and strong degree of rent reduction, which rents decrease no more than 20%, 40% and 55%, respectively, the forecast reveals a maximum vacancy rate of 36%, 29%, and 22%, respectively. The most important criteria for tenants in selecting office space is location and convenience in terms of greater access to parking, mass transit and low utilized traffic routes. The depressed market is the best time for developers or investors with a lot of capital to buy buildings at a low price and sell them at high price, when the market rebounds. It is also a good opportunity to diversify into consulting services especially asset management in an effort to turn troubled assets into marketing assets.

Thesis Supervisor : William C. Wheaton
Title : Professor, Economics

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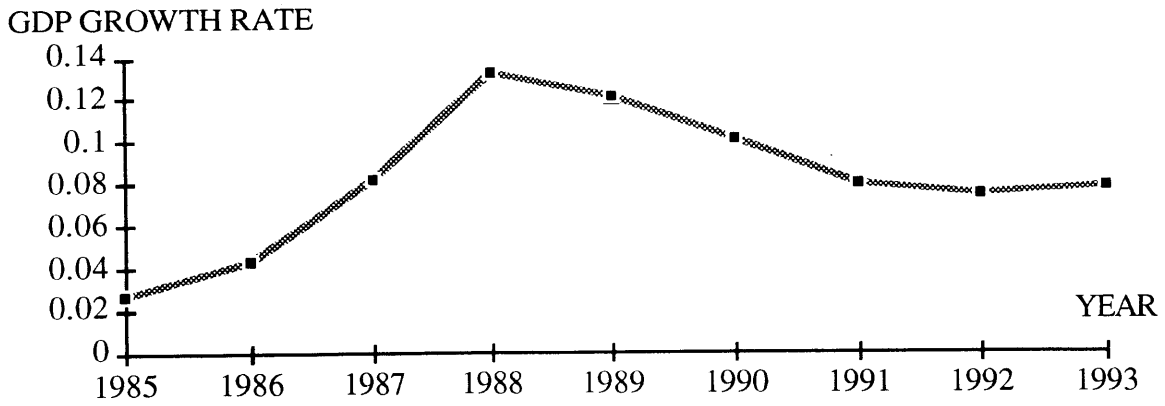
INTRODUCTION

As the fastest growing region in the world since the late 1980's, South East Asia has attracted many investors from all over the world.

One of the most attractive countries in the South East Asia region was Thailand, especially the late 1980's. Land prices were cheap, skilled human resources were available at incredibly inexpensive wages (the minimum wage was less than $4 per day), and the government was supportive of foreign investment. With its prime geographic location and its relatively stable political situation, Thailand has a high potential to be a regional center of business on all of South East Asia.

The large flow of foreign investment into Thailand has pushed the Thai economy from one that was based primarily on agriculture to a more diversified manufacturing base. This economic boom is clearly reflected in Thailand's real GDP growth, as shown in Figure 0.1.

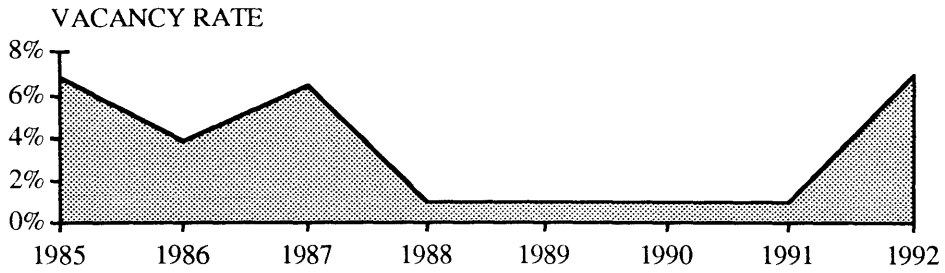
Figure 0.1 Thailand GDP growth rate (1985-1993)



Source : Country Report : Thailand 1993, The Economist Intelligence Unit.

The economy has had a favorable impact on many industries, especially the office development market. During the late 1980's, demand in office space soared, every building benefited as the vacancy rate decreased to 1%, as shown in Figure 0.2.

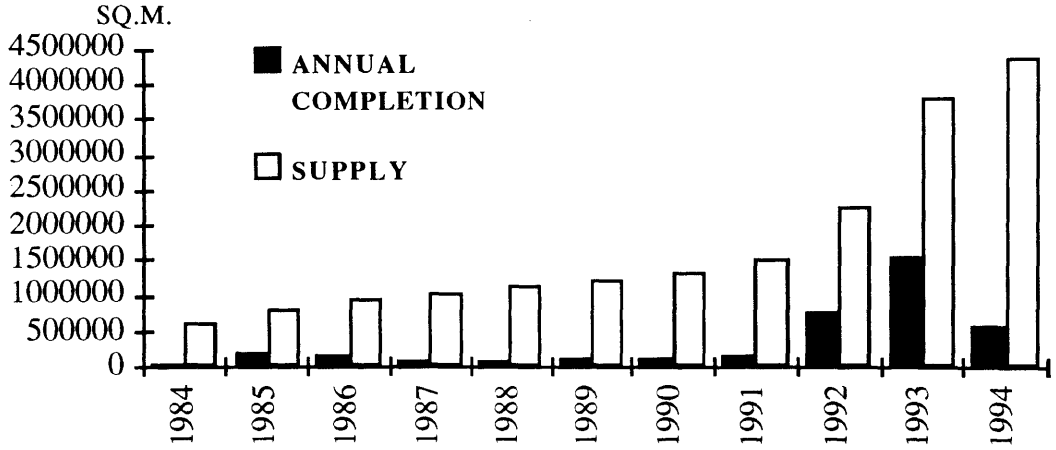
Figure 0.2 Vacancy rate of Bangkok office market (1985 to 1992)



Source: Jones Lang Wootton (Thailand)

The extremely low vacancy rate attracted many investors for new office building projects. As a result, the office space supply in Bangkok increased to match with the demand in 1992. (see Figure 0.3)

Figure 0.3 Office space stock in Bangkok (1984 to 1994)



Source: Jones Lang Wootton (Thailand).

In 1993, new office space keeps on increasing, even though the demand was already matched in 1992. New office space, expected to be completed during 1993 and 1995 , will more than double the stock of office space in 1992. However, this increased office space stock has not been fully supported by an increase in demand.

As seen in Figure 0.1, the economy slowed down in 1991. This was a result of the Gulf war, a world recession and constraints with Thailand's infrastructure. So, did the demand in office space.

What would happen to the immense new office spaces, expected to be completed between 1993 and 1995? How high will vacancy rate raise? Will the office market collapse? What will happen with rent and quality of office space in Bangkok? What should real estate companies do to survive? Big changes in term of economic conditions and industry structure are imminent. Office real estate market will face tremendous changes that has never been experienced before.

This thesis focuses on how the Bangkok Metropolitan office market grows and is now facing its first real estate bust cycle, from macroeconomics, microeconomics and strategic perspectives. In macroeconomics, the discussion includes an analysis of demand and office space stock, followed by a demand elasticity analysis. The purpose is to investigate the anticipated effect of space absorption on lower rents, a vacancy rate and a recovery period. The microeconomics section explored the changing character of office space stock. Many buildings add new amenities to improve quality. This section examines how the market evaluates these buildings in term of office rents, through both econometric method and questionnaire method. In the last chapter, the study closed

with strategies that real estate companies and other players in Bangkok expected overbuilt market could use to survive to enjoy the next boom period.

CHAPTER 1
THAILAND OUTLOOK

Recently, many changes have occurred in Thailand. Before analyzing the country's office market, this section presents some background information about general economic conditions, various factors and problems affecting the Bangkok Metropolitan office market, and a overview of the office market.

THAILAND OUTLOOK

GENERAL

Thailand is located in the Indochina peninsula, surrounded by Laos , Cambodia, Mianmar (Burma), Malaysia , the Gulf of Thailand and the Andaman sea , as shown in Appendix 1.

The official language of Thailand is Thai. Although English is taught in high schools, English skill levels are below average for South East Asia.[1] Thailand has been less influenced by western countries, because it has never been colonized.

Fifty-nine million Thai people live in 198,115 sq.mi (or 514,000 sq.km)[2], which is in between the size of California and Texas. Although the Bangkok Metropolitan Area accounts for approximately 2% of the country's land mass(see Figure 1.1) ,the country is centered around the Bangkok Metropolitan area.

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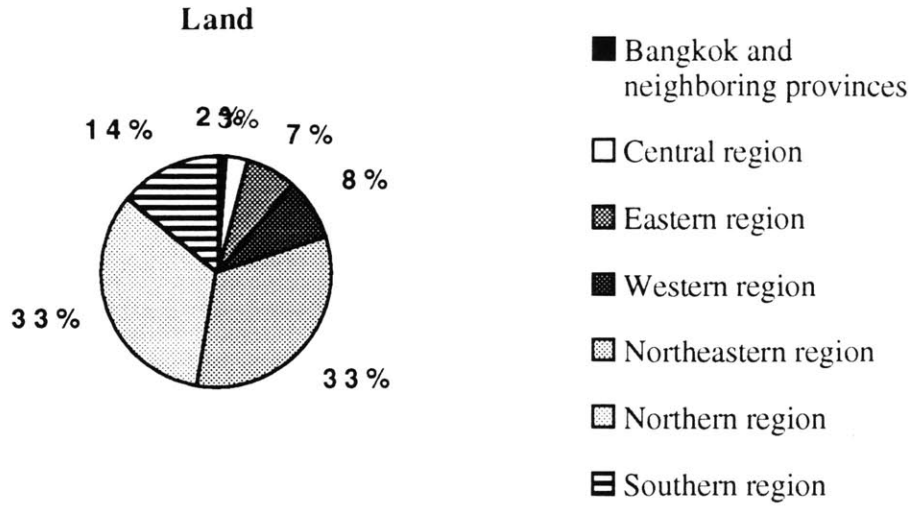
1 The Economist Intelligence Unit, Country Profile Thailand and Myanmar(Burma) 1992-93, p.9

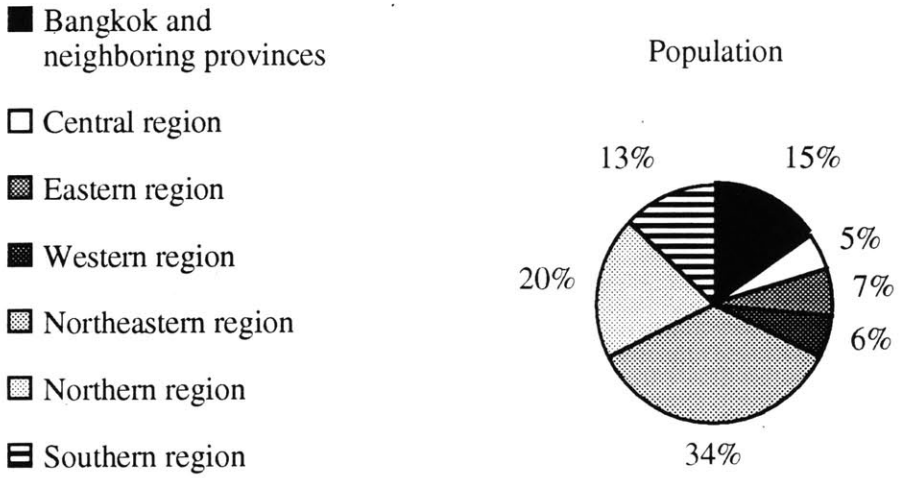
2 Wright John W., The Universal Almanac, 1993, p.467.

Figure 1.1 Land in Thailand classified by geography



Source : Analysis of Thailand Appraised Land Value (1992-1995), Alpha Research, Thailand.

Figure 1.2 Thailand population classified by geography



Source: Registration department, Ministry of Interior, Bangkok, Thailand.

Bangkok has a population of 5.9 million people, but the metropolitan area now extends to neighboring provinces and may contain 8.5 million people[3], or 15% of the population. (see Figure 1.2)

Other big cities are significantly smaller than Bangkok. Thailand has the most homogeneous population in South East Asia, all but 5% of Thai are Buddhists.[4] In addition, approximately 5.9 million people are of Chinese decent, and they have become well-blended with the local people. Like other Asian countries, most of the Thai economy is in the hands of a Chinese-ancestor population.

POLITICAL BACKGROUND

Thailand has a constitutional monarchy system, in which the king plays little direct role in the government. The prime minister, together with the mostly elected parliament, govern the country.

Thai democracy is maturing. Although the military's role in Thai politics is declining, Thailand has had several recent military coups. These events have helped create negative perceptions of Thailand for many foreign investors.

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3 The Economist Intelligence Unit, Country Profile 1992-93: Thailand, Myanmar(Burma) , p.9

4 Ibid, p.9

ECONOMY

The Thai economy has experienced immense changes, especially during the late 1980's . The economy turned from an agricultural export base, depending primarily on rice, rubber, and tin, to a manufacturing export base. Major export products are textiles. Thailand's low labor costs and currency appreciation in the New Industrialized Countries (NICs) helped Thailand attract massive investment from Japan and Taiwan. Furthermore, new labor intensive industries such as integrated circuits, footwear, and electronic assembly have entered the country. The major production in Thailand is classified by sector, and is shown in Table 1.1.

Table 1.1 : Sectoral origin of Gross Domestic Product (GDP) and production growth

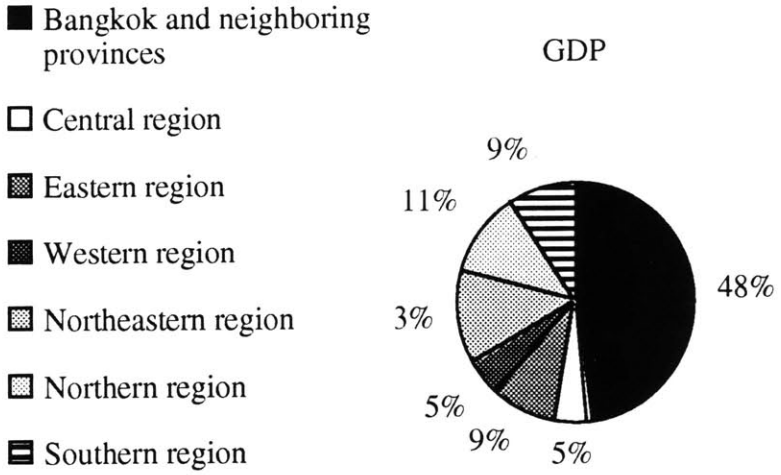
	Source of GDP1990		Production Growth	
Sectors by ranks	(Bt MN)	% of total	1991	1992
1) Manufacturing	535,396	26.1%	9.4%	9.3%
2) Wholesale & retail trade	312,738	15.2%	7.7%	6.6%
3) Services	278,630	13.6%	n/a	n/a
4) Agriculture	254,523	12.4%	4.5%	3.5%
5) Construction	146,817	7.2%	17.5%	5.0%
Others	973,104	25.5%	7.8%	8.6%
GDP	2,501,208	100%		

Source: Bank of Thailand, Quarterly Bulletin December 1992.

Manufacturing sectors are growing faster than agricultural sectors. The demand of new office and manufacturing space has led to a dramatic increase in construction.

Although the Bangkok Metropolitan land area covers only 2% of Thailand's land area, as much as 48% of gross domestic product (GDP) is from Bangkok , as shown in Figure 1.3 below:

Figure 1.3 Thailand GDP classified by geography.



Source: National Statistic Office, Office of the Prime Minister, Thailand.

The Thai economy is highly dependent on the US and Japan, who take account for 22% and 18% of exports from Thailand, respectively.[5] Exports are growing steadily.

It is interesting that although foreign investment is important to the Thai economy, it represents only about 8% of the country's total investments. [6]

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5 Ibid, p.33.

6 The Economist Intelligence Unit, Country Report 1993: Thailand , Myanmar (Burma), p.8

LABOR AND WAGES

University-graduated labor is concentrated in big cities, especially Bangkok. Of all university applicants, 75% are from Bangkok. Therefore, businesses dependent upon a white collar labor force are centralized in this area.

Labor costs in Thailand are rather low. The minimum wage required by the government is approximately $4.70 per day[7]. More than half of the total employment is in the agricultural sector; although many workers are now turning to the manufacturing sector.

After the economic boom, the unemployment rate in 1991 and 1992 dropped to 3.1%.There is a shortage of certain types of labor, including accountants, computer programmers and workers with a proficiency in English. However, higher wages have already boosted private consumption in the urban areas and stimulated the economy.[8]

CAPITAL MARKET

Founded in 1975, the Security Market of Thailand (SET) has been growing rapidly since 1986 and is expected to become a significant source of capital for industry in the coming years. This growth has stimulated a number of foreign finance and banking companies to open businesses in Thailand. The Bank of Thailand is in the process of easing banking regulations to allow foreign financial institutions to compete freely with fifteen local banks, lead by Bangkok Bank (the biggest bank in the South East Asia).[9]

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7 The Economist Intelligence Unit, Country Profile 1993: Thailand , Myanmar (Burma), p.14

8 Ibid, p.13

9 Ibid, p.30.

Thailand has had a strong and stable currency for a long time. The current exchange rate is US$ 1 = Baht 25.40 [10]

INFRASTRUCTURE

A lack of infrastructure is a major concern for the economy as well as the real estate industry. Thailand did not have a master plan to create sufficient infrastructure to support future urban growth. Therefore, the boom that started in 1987 added a tremendous demand to existing infrastructure and created an inadequate supply of various kinds of facilities, especially transportation and water. The most serious problem in the Bangkok area is traffic. The government now pays serious attention to the infrastructure problem, but it will take many years to improve the country's infrastructure system.

a) Bangkok Transportation system

The transportation system of Thailand and Bangkok depends primarily on a road net work. Although road construction is a top priority in the government's development plan, traffic congestion in Bangkok has been great. In the Bangkok Metropolitan area, the number of cars has increased faster than new roads. In addition, many roads are partly closed down for construction. The average traffic speed in the inner city is approximately 6 km./h.[11] Although, much effort in recent years has concentrated on improving rural feeder roads, traffic will continue to be a problem for at least a few more years.

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10 The Economist Intelligence Unit, Country Report: Thailand, Myanmar (Burma) 1993, p.3

11 Interview with Prof. Krisda Arunvongse, the Governor of Bangkok Metropolitan Administration, May 22, 1993.

Bangkok is one of a few large cities in the world that does not have an extensive mass transport system. At present, only a public bus system serves throughout the city. However, the government plans to develop more infrastructure to serve the rapid growth in Bangkok. The projects include expressway systems, which are partly finished, and a mass transit railway systems, which are known as the Hopewell and Skytrain projects. These projects, however, are still in a long negotiation process. According to one construction contract, the mass transit railway system should finish by year 2001. [12]

b) Ports

All but 5% of imported products go through the congested Bangkok port. However, a new alternative deep water port, is located in the Eastern seaboard near the petrochemical industries. A new railway system will link the Eastern seaboard and Bangkok. Much development is occurring along the road that goes toward the Eastern seaboard. Besides another existing sea port in the southern part of Thailand, the government is thinking of constructing a new deep water port, facing the Andaman sea in the southern seaboard. This port will directly tie to businesses in the Malaysia and Singapore markets.

c) Utilities

Like the road system in Bangkok, water and electricity in the Bangkok Metropolitan area lack a master plan to incorporate the rapid expansion of the city. Utilities production cannot increase as fast as the city growth. The problem is stronger for water capacity. The traffic problem

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12 Inteview of Prof. Krisda Arunvongse, Governor of Bangkok Metropolitan Administration, May 23, 1993.

makes water pipeline expansion impossible due to the location of the water pipelines under the congested roads.

Inadequate telephone service has been aided recently by a 2 million line expansion project in Bangkok and a 1-million line network for the provinces. [13]

URBAN DEVELOPMENT TRENDS

Due to a lack of master plans and urban planning, the business district is congested and squeezed into a small Central Business District (CBD) area called Silom. The infrastructure is not sufficient to serve the city's dramatic growth. Bangkok faces, therefore, serious traffic problems and water deficiency. The first Bangkok city plan was enforced in 1992, when the city was experiencing a rapid growth.

In order to mitigate the city's high density problem, the city could build suburban towns around Bangkok with office, residential and commercial buildings. The suburban towns would be self-supporting. People would live, work and go shopping in the same area, without commuting to the CBD.

Will Bangkok be surrounded with suburban towns from all directions? The answer is "no". The government has planned to develop only the northern and eastern parts of Bangkok; green area controls surround the western and southeastern parts of the city. Growth from the southern part of Bangkok is limited by a river, as shown in Bangkok map in Appendix 2.

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13 The Economist Intelligence Unit, Country Profile 1992-1993, Thailand, Myanmar (Burma), p.25

Development is allowed on the northern part of Bangkok. The eastern part is the most active area, evidenced by a plan for a new airport in Nong Ngu Hao and a deep sea port on the Eastern Seaboard. Many office condominiums have been developed along the Bangna-Trad road to serve businesses in Bangkok and on the Eastern Seaboard.

OVERVIEW OF THE BANGKOK METROPOLITAN OFFICE MARKET

Before the 1980's, most businesses occupied shophouses, which are building less than 7 floors high and have both residential and commercial spaces. However, both the economy and consumers' behavior have changed. Tenants are increasingly concerned about the "quality" of office buildings. In 1991, approximately 75% of all offices are in high rise buildings.[14]

Since the economic boom in 1985, new investments have flourished in Bangkok. The office space market experienced a demand shock and turned into a seller's market. Every additional office building constructed was bought or leased prior to, or soon after, completion. The vacancy rate fell from 11.4% in 1982 to 6.5% in 1987 and then to 1% in 1988 to 1991.[15] (see Figure 1.4) The market faced a supply constraint during 1988 to 1991(see Figure 1.5).

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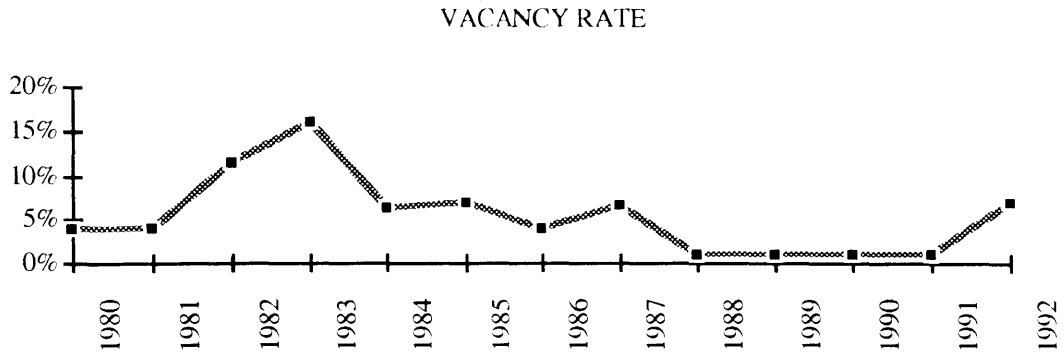
14 First Pacific Davies (Thailand), The Bangkok Office Market (May 1991), p.15

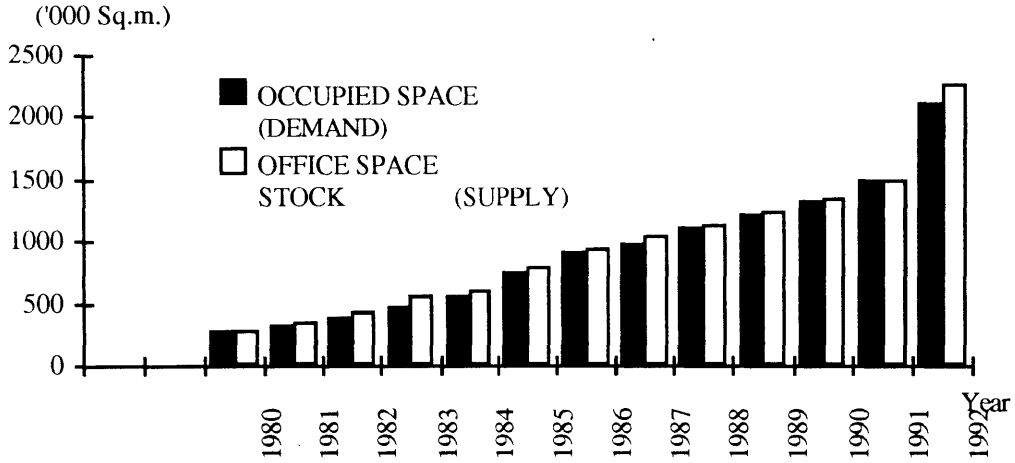
15 Jones Lang Wootton, Office Market Analysis 1992.

Figure 1.4Vacancy rate during 1980 to 1992.



Source: Jones Lang Wootton (Thailand)

Figure 1.5 Office space stock and occupied space (1980 to 1992)



Source : Jones Lang Wootton (Thailand)

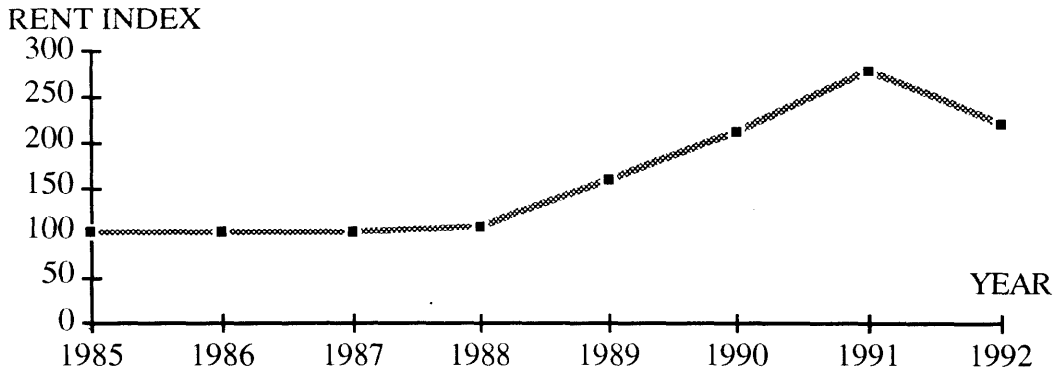
The increase in office space demand encouraged investors to seek significant profits from speculative office development. Over 3 million sq.m. of office space is projected to enter the market from 1993-1995. This amount of new space will more than double the amount of office space in 1992, the year the supply constraint ended. As a result, the Bangkok office market is approaching a serious overbuilt problem. How distressed will this situation become? How long will it last? What should

developers do to survive this bad market? What kind of office space is in demand during a down turn market?

OFFICE RENTAL LEVEL

In 1987, the average rent was only Baht 200 per sq.m. per month. The average rent soared to almost Baht 600 per sq.m. by 1991.[16] (see Figure 1.6)

Figure 1.6 Average rent index

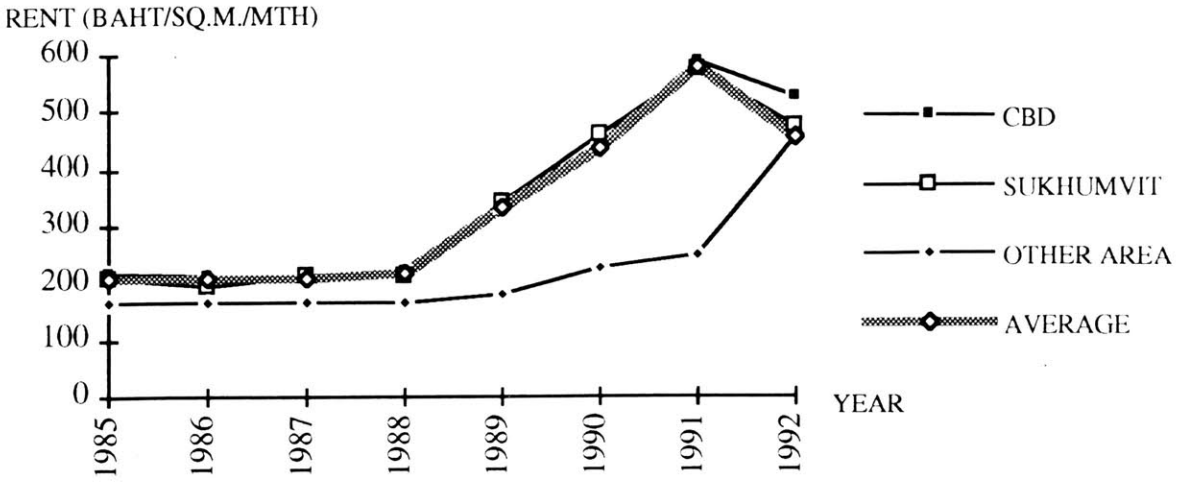


Source: American Appraisal (Thailand) Ltd.

During the supply constraint period, the office rents in the CBD and a suburb of Bangkok, were slightly different, because tenants did not have many choices. Since 1991, a substantial increase in office space stock has increased a rent competition. In addition, traffic problems raised a location value. Therefore, tenants have valued the CBD location higher than others. The gap of rents in the CBD and other area, therefore, has been increasing over time, as shown in Figure 1.7

Figure 1.7 Comparison of rents at CBD and suburb areas

16 American Appraisal (Thailand), Demand and Supply Survey of First Class Office Buildings in Bangkok June 1992, p.10.



Source: American Appraisals (Thailand) Ltd.

In 1991, the sharp increase in rents in other area does not indicate that the demand shifted to surburban areas, but that the quality of the office buildings in other area considerably increased. Offices in the CBD still command the highest rates, which indicates the preference among business establishments to operate in the CBD area. At the same time, the new supply of office space is mainly in the CBD area, indicating by 40% of Bangkok under construction office space located in CBD area. The office space under construction will increase office stock of the CBD area by one and a half times of the existing office stock in the CBD in year 1992.[17]

In 1991, rents peaked in the CBD, for an average of Baht 750 per sq.m. per month. The highest rent level was Baht 920 per sq.m. per month. The current rent level ranges between Baht 550-650 (April 93) in the CBD, and Baht 325 -500 outside the CBD[18]. Since 1992, the rent has been declining.

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17 American Appraisal (Thailand) Ltd., First Class Office Buildings in Bangkok Demand and Supply Survey: June 1992, p.11.

18 Colliers Jardine (Thailand), Commercial Office Property Market: Bangkok, June 1993.

With declining rents and an expected increase in office space stock, the Bangkok office market has reached the point of a building owners' worst nightmare, a state of oversupply. The next two chapters explore how strong the effect will be and how long it will last.

CHAPTER 2
A MACROECONOMICS MODEL OF BANGKOK OFFICE MARKET

In the last decade, the supply constraint in the Bangkok Metropolitan office market led to two different absorption behaviors, supply constraint condition and unconstrained condition. This chapter explores how to use historical data to forecast the future absorption and a vacancy rate.

This chapter starts by applying a theoretical model, used in the US office market to the Bangkok office market. The second section discusses absorption models, projected absorption and expected vacancy rates, which lead to a study about the effect of a rent reduction in chapter 3.

ANALYSIS OF ABSORPTION

In the housing market, prices or rents normally adjust within one year, resulting in unit demand equal to stock. The vacancy rate tends to be both low and relatively stable over time. In a commercial market, there is wide spread evidence that vacancy fluctuations are far more pronounced and persist for many periods. This suggests that rents or prices do not clear in the market, and that demand must be measured distinct from supply-- that is, as the amount of occupied space. This can be explained in the complicated leasing agreements that characterize commercial space.

Firms may wait until their leases expire before adjusting their space consumption. [1]

This study focuses on the demand side and its impact on vacancy. The demand for office space can be measured as the actual consumed or occupied space, OCt. OCt over time is defined in equation (1) as the amount of occupied space in the previous period plus the net absorption, ABt. Net absorption of office space is the change in the amount of occupied office space from period to period as equation (1). The vacancy rate, Vt, is defined as the percentage difference between the total stock, St, and that which is occupied, as equation (2).

$$OC_t = OC_{t-1} + AB_t \qquad (1)$$

$$V_t = (S_t - OC_t) / S_t \qquad (2)$$ [2]

Net office space absorption depends on two factors: employment growth and change in space per worker. Employment growth in a metropolitan area is highly correlated to the office space absorption. Change in space per worker is measured in demand elasticity. Office space usage also depends on its price. During periods when office vacancy is high and rents low, firms often increase their space use per worker. Therefore, space per worker varies with rent or vacancy.

In order to model net absorption two equations are created ,one for desired space and another for actual absorption.

The first equation is for desired space which is a function of employment and space per worker. Space per workers depends in turn on

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[1] DiPasquale Denis, Wheaton William , The Economics of Real Estate Markets, Prentice Hall, Chapter 13, p.2

[2] Ibid, p.3

rent. Let OC* represent desired space or potential demand. Desired space is the amount of space that all firms in the market would in principle demand if there were no leases, moving or adjustment costs to obtaining such space. Demand for office space is a function of office employment, Et, and rent, as equation 3.

$$OC_t^* = \text{Desired space} = f(\text{Employment, Rent}) \quad (3)$$

The actual consumption of space, OCt, however, does not always equal OCt*, because the firm cannot immediately adjust their consumption in response to changes in demand. Assuming a fraction (ø) of leased space can adjust in each period, the net absorption equation will be

$$AB_t = \text{ø}\,(OC_t^* - OC_{t-1}) \quad (4)$$

Combining equation (3) with equation (4), the absorption equation will be :

$$AB_t = \text{ø}^* f(\text{Employment, Rent}) - \text{ø}^*(OC_{t-1}) \quad (5)$$

When office space stock can be estimated from the forecast future completion and absorption can be calculated from above equations, then vacancy rate is predictable, with equation (1)+(2).

METHODOLOGY

It is important to note that this study does not include a discussion of shophouses, which are buildings with less than 7 floors and mix residential and commercial uses. Although shophouses accounted for 25%[3] of the total office market, its characteristics and uses are fairly different from those of office condominiums, and the data of shophouses are limited.

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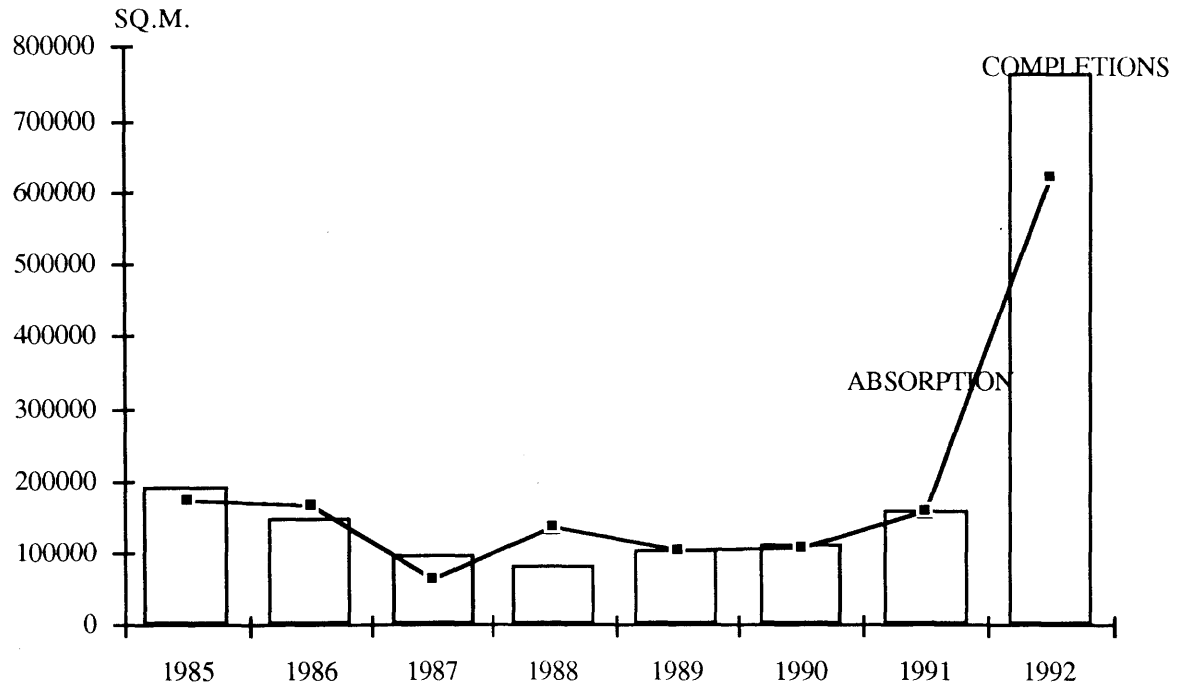
[3] First Pacific Davies (Thailand) Ltd., The Bangkok Office Market (May 1991), p.15.

Including shophouses in this analysis would have skewed the result of this study.

The supply constraint in the Bangkok Metropolitan office market has led to two different absorption behaviors, as seen in Figure 2.1. Between 1988 to 1991, office absorption did not reflect demand because of the limited office supply. The market was able to absorb only what was available, not what was demanded. Before 1988, office absorption reflected real demand. By 1992, some of the excess demand was met. To analyze market behavior before 1988 and after 1991, two separate equations must be used to model each behavior pattern.

Figure 2.1 Annual absorption, completions and vacancy rate



Vacancy	*7%*	*4%*	*7%*	*1%*	*1%*	*1%*	*1%*	*7%*

Source: Jones Lang Wootton (Thailand)

During the 1988 - 1991 period, the vacancy rate dropped to 1%. This drop implies that any office completions were fully absorbed. The 1% vacancy rate represents the vacancy rate, which is effectively constrained. When the office space stock is limited, the absorption rate may not represent the demand for office space. Outside that period, vacancy rates are higher, implying an unconstrained absorption pattern.

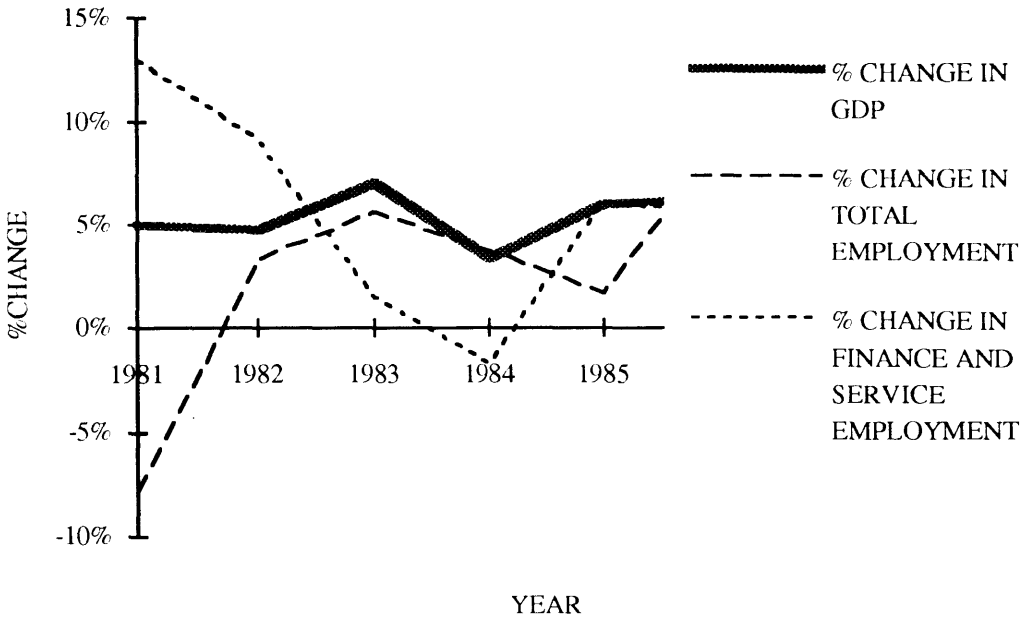
The office space absorption during the constrained period, 1988 to 1991, is equal to completions. All space is leased. The absorption model is represented by a simple identity : Absorption = Completions.

For an unconstrained absorption pattern, before 1988 and after 1991, the model described above has been applied through a multiple regression equation. Several variables have been tried to find the best representation for Bangkok office employment. The effects of price changes on office space demand are not statistically estimated in this chapter; but are determined in chapter 3 through an analysis of survey current and prospective tenants.

DATA

In theory, employment in the Bangkok Metropolitan area should correlate perfectly with demand for office space in that area. At a certain rent level, average space per worker is constant. Therefore, employment should directly present how much office space is needed. Thai employment figures, however, do not confirm this expectation, as shown in Figure 2.2.

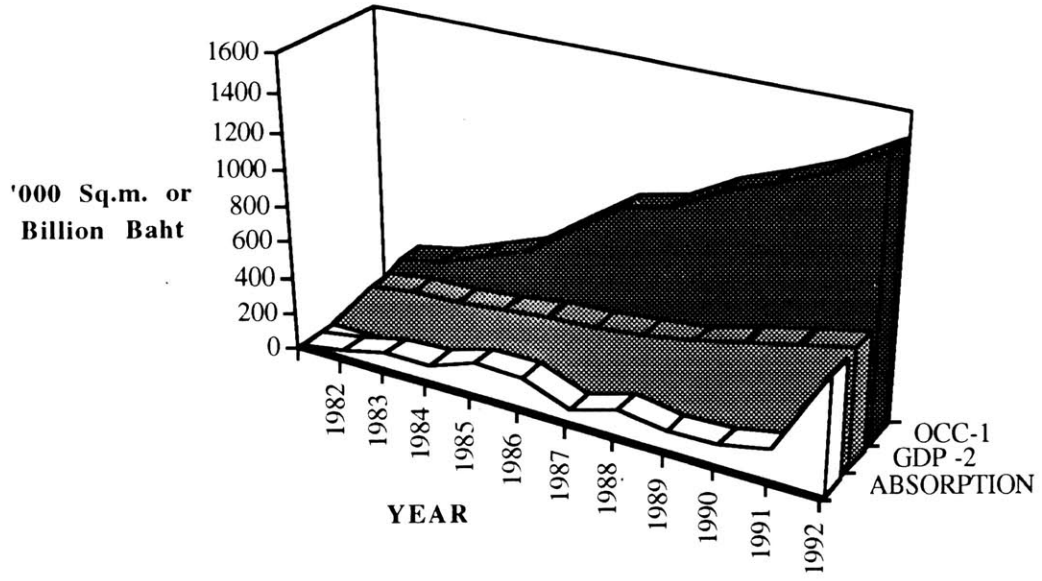
Figure 2.2 Gross Domestic Product (GDP) and employment of Thailand (1981 to 1988)



Source: Statistical Yearbook for Asia and the Pacific 1992, United Nations.

In general, Gross Domestic Product (GDP) presents an output of an economy which directly depends on a level of employment, an input of economy. However, the figure 2.1 shows an uncorrelated relationship between employment and GDP. GDP is more reliable than employment data,because it is an important economic indicator. The GDP reflects a more reasonable movement, relating to Thailand's economic situation. The deviation of employment data is possibly due to methodology or accuracy problems. Therefore, employment is replaced by GDP data in this analysis, as shown in Figure 2.2.

Figure 2.2 Thailand's GDP, office space absorption and Office space stock



Source: Jones Lang Wootton (Thailand)

Statistical Yearbook for Asia and the Pacific 1992, United Nations

Although the GDP represents the production of the whole country, Thailand's economic activity is centralized in the Bangkok Metropolitan area, who generates 48% of Thailand's GDP. The GDP, therefore, is a good indicator of any economic change in the Bangkok. Figure 2.2 shows a relationship between GDP and office real estate market. In general, absorption correlates to GDP, except during 1988 to 1991,when the market faced a supply constraint. In 1992, the pent-up demand raised the absorption to extraordinarily high level. Therefore, the analysis grouped the data into two absorption patterns, as the discussion under results of

analysis section. The data used in the regression equation is shown in Table 2.1.

Table 2.1 Data

The data used in this analysis are listed below:

YEAR	ABSORPTION ('000 SQ.M.)	VACANCY (%)	CUMULATIVE SUPPLY ('000 SQ.M.)	GDP (BILLION BAHT)	OCCUPIED STOCK ('000 SQ.M.)
1980		4%	288	293	276
1981	n/a	4%	340	318	327
1982	41	11%	429	331	380
1983	88	16%	558	355	469
1984	99	6%	605	381	567
1985	175	7%	797	394	743
1986	168	4%	947	414	911
1987	64	7%	1,043	453	975
1988	139	1%	1,125	513	1,114
1989	105	1%	1,231	574	1,219
1990	109	1%	1,342	632	1,328
1991	159	1%	1,502	683	1,487
1992	622	7%	2,268	n/a	2,109

Gross Domestic Product (GDP) is from Statistical Yearbook for Asia and Pacific 1992 , prepared by the United Nations. As mentioned in chapter 1, only 12.4% of GDP came from an agricultural sector. The rest is mainly from manufacturing, service and wholesale businesses, which concentrated in the big cities, especially Bangkok. Forty eight percent of GDP is generated from the Bangkok area.

Projected GDP The GDP projection is derived from the revised GDP projection, prepared by the National Statistical Office, Office of the Prime

Ministry, Thailand. This GDP projection is in accordance with a social and economic plan no.7, Thailand's master economic and social planning. In addition, these figures are similar to projected GDP prepared by Thailand Development Research Institute (TDRI), as shown in Table 2.2.

Table 2.2 Forecast data: projected GDP and completion

PROJECTED GROSS DOMESTIC PRODUCT (GDP) (1993 TO 2001)

YEAR	GDP(t) Based on 1972 Price Level		GDP(t) (Billion baht)	GDP (t-2) Based on 1972 price (BILLION BAHT)
	Source: TDRI (BILLION BAHT)	Source: National Statistic Office (BILLION BAHT)		
1991	684	684	684	
1992	747	735	735	
1993	809	792	792	684
1994	877	857	857	735
1995	946	925	925	792
1996	1,020	998	998	857
1997	1,101	N/A	1,079	925
1998	1,187	N/A	1,165	998
1999	1,278	N/A	1,256	1,079
2000	N/A	N/A	N/A	1,165
2001	N/A	N/A	N/A	1,256

PROJECTED COMPLETION (1993-1995)

YEAR	LIKELY TO BE COMPLETED		COMPLETION NOT CERTAIN	
	NO OF BLDGS	AREA ('000 SQ.M.)	NO OF BLDGS	AREA ('000 SQ.M.)
1992	37	755	0	0
1993	52	1,385	4	87
1994	24	865	15	440
1995	4	259	11	426
TOTAL	117	3,264	30	953

COMPLETION YEAR	TOTAL		CUM. SUPPLY ('000 SQ.M.)
	NO OF BLDGS	AREA ('000 SQ.M.)	
1992	37	755	3,023
1993	56	1,472	4,495
1994	39	1,305	5,800
1995	15	685	6,485
TOTAL	147	4,217	

Other data Vacancy rate, absorption, previous years occupied stock are all extracted from Office Market Analysis 1992, prepared by Jones Lang Wootton (Thailand).

Projected Completion of Office Space The information is extracted from First Class Office Buildings in Bangkok: Demand and Supply Survey prepared by American Appraisals (Thailand) in June 1992. Projects are in various stages of construction. During a changing market, many projects could be delayed or in some case scrapped all together.

In statistical theory, the equation would be more accurate if the sample size were at least thirty. Data in the real estate industry in Thailand, however, is limited. Therefore, given the available data, the following approach is the best method to forecast demand absorption.

RESULTS

Since absorption patterns were different in two periods, two absorption equations are derived to fit to each situation:

1) Supply Constraint Absorption Equation

During the 1988 - 1991 period, office space stock was limited. Therefore, absorption could not exceed available given supply . Absorption is equal to construction completion in that year, as shown in Table 2.3.

Table 2.3 Annual Completion

YEAR	COMPLETION (SQ.M.)	ABSORPTION (SQ.M.)
1988	82,200	138,739
1989	106,300	105,237
1990	110,443	109,339
1991	160,520	158,915
1992	766,002	622,000

Source: Jones Lang Wootton (Thailand)

2) Unconstrained Absorption Equation

After applying multiple regression analysis, the study shows that the best-fit equation is as follows:

$$AB(t) = -829.7 + 3.69 (GDP_{t-2}) - 0.59 (OC_{t-1})$$

Given:

AB represents absorption rate at year t.

GDP_{t-2} represents gross domestic product lagged two periods.

OC_{t-1} represents occupied office space one period before year t.

From a statistical point of view, this is an excellent equation. Absorption rate is perfectly related to the two variables, gross domestic product lagged 2 years and last years occupied office space.

Simple Statistical Analysis:

Examining the equation with a simple statistical method, the major indicators are R square and t statistic. The R square tells how well this equation can estimate the absorption. The t statistic tells the importance of each variables, GDP_{t-2} and OC_{t-1}, and whether any of variables should be eliminated. Table 2.4 shows the statistical result of the absorption equation.

Table 2.4 Statistical Results of Absorption Equation under Unconstrained Condition.

Regression Statistics

Multiple R	0.992094039
R Square	0.984250581
Adjusted R Square	0.977950814
Standard Error	28.34974202
Observations	8

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	2	251136.2332	125568.1166	156.2360167	3.11287E-05
Residual	5	4018.539362	803.7078724		
Total	7	255154.7725			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*
Intercept	-829.689996	87.7271486	-9.45761956	3.08616E-05
GDP t-2	3.699372245	0.433559444	8.532560636	6.02651E-05
OCC t-1	-0.59475954	0.120957619	-4.91709035	0.001719324

The closer R square is to "1", the better the equation. In this analysis, R square is 0.984, which means that the equation is a marvelous estimate of the absorption.

A good t-statistic should be less than -1.96, and higher than 1.96. In this case, t statistic values tell that both GDP t-2 and last year stocks are key factors in this regression.

An F value represents how much the sample can be explained by this regression, compared to how much the sample includes an unexplained error. For this equation, the high F value of 156 means the regression can explain absorption behavior very accurately.

To prove that the methodology of separation absorption into two times periods, is effective, Table 2.5 shows the absorption equation that included all 12 data sets. The data set with two types of absorption behaviors- unconstrained and supply constraint absorption- resulted in a worse absorption equation.

Table 2.5 Absorption Equation From Two Types of Absorption Behaviors

Regression Statistics

Multiple R	0.786124598
R Square	0.617991884
Adjusted R Square	0.533101191
Standard Error	105.214175
Observations	12

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	2	161176.3063	80588.15316	7.279854427	0.013162145
Residual	9	99630.20356	11070.02262		
Total	11	260806.5099			

	Coefficients	*Standard Error*	*t statistic*	*P-value*
Intercept	-594.3607715	237.87328	-2.498644537	0.029577545
GDP (t-2)	2.870096878	1.150970128	2.493632814	0.029842157
OCC (t-1)	-0.530622574	0.310510978	-1.708868965	0.115501023

Interpretation:

The absorption equation during the supply constraint period is so simple that it requires little explanation. Therefore, this section only explains how an unconstrained equation is interpreted.

The equation

$$AB(t) = -829.7 + 3.69 (GDP_{t-2}) - 0.59 (OC_{t-1})$$

On the other hand, this equation will be transformed to:

$$AB(t) = 0.59 [(-1405 + 6.254 GDP_{t-2}) - OC_{t-1}]$$

Which is like equation (5) :

AB(t) = Adjustment rate [Desired space - Last year occupied space]

The desired space depends on the volume of business two years ago, represented by GDP_{t-2}. The lag in production volume is a result of the length of lease contracts, which mostly vary from 3 to 5 years, and the time needed to prepare an office extension or shrinking plan. Therefore,

after the volume of business increases, it takes a few years before the tenant can move to a new place that is suitable for the workload.

From the unconstrained absorption equation, total desired space equals -1405 + 6.254 GDP $_{t-2}$. For each additional 1% increase in GDP, there is an 1.87%[4] increase in a desired office space. On the other hand, for each additional billion Baht increase in GDP, there is an additional need for 6,254 sq.m. of office space.

It is important to note that additional needed space does not equal to absorbed space. The additional need in office space (desired space deducted by the space occupied in the last period) is not fully absorbed in one year. Only 59% of the additional space needed is absorbed in that year. The rest would shift to next year's desired space. The unsatisfied desired space accumulates over a period of time, and only 59% continues to be absorbed each year.

FORECAST OF VACANCY RATE

During 1988 to 1991 , the equation predicted that an unconstrained absorption rate would be an average of 281.43K sq.m. per year [6.254 * (GDP_t - GDP_{t-1}) = 281.43 K sq.m.]. Actual absorption over these four years accounted for 512 K sq.m. Pent-up demand during the supply constraint period is 613.72K sq.m. (see Table 2.6)

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[4] 1.87% is calculated from 6.254 * GDP 92/desired space 92
= 6.254 * GDP92/ (OC91+AB92)
= 6.254 * (632/ (1487 + 622))

Table 2.6 Forecast of Absorption and Vacancy Rate

YEAR	GDP -2 (BILLION BAHT)	OC (t-1) ('000 SQ.M.)	ABSORPTION ('000 SQ.M.)	STOCK ('000 SQ.M.)	VACANCY RATE
1980	*261*			*288*	*4%*
1981	*277*	*276*	*n/a*	*340*	*4%*
1982	*293*	*327*	*41*	*429*	*11%*
1983	*318*	*380*	*88*	*558*	*16%*
1984	*331*	*469*	*99*	*605*	*6%*
1985	*355*	*567*	*175*	*797*	*7%*
1986	*381*	*743*	*168*	*947*	*4%*
1987	*394*	*911*	*64*	*1,043*	*7%*
1988	*414*	*975*	*139*	*1,125*	*1%*
1989	*453*	*1,114*	*105*	*1,231*	*1%*
1990	*513*	*1,219*	*109*	*1,342*	*1%*
1991	*574*	*1,328*	*159*	*1,502*	*1%*
1992	*632*	*1,487*	*622*	*2,268*	*7%*
FORECAST: IGNORING RENT REDUCTION					
1993	684	2,109	446	3,023	**15%**
1994	735	2,555	371	4,495	**35%**
1995	792	2,926	360	5,800	**43%**
1996	857	3,286	386	6,485	**43%**
1997	925	3,672	407	6,485	**37%**
1998	998	4,079	435	6,485	**30%**
1999	1,079	4,514	476	6,485	**23%**
2000	1,165	4,990	511	6,485	**15%**
2001	1,256	5,501	544	6,485	**7%**

NOTE: Cumulative supply after 1997 are assumed constant, due to a limited building completion data.

In 1992, the supply constraint on the office market ended. The pent-up demand boosted the absorption up to 622K sq.m. in 1992. Given GDP_{t-2} level in 1991, our equation forecasts an absorption of 446 K sq.m. in 1993. Therefore, during 1992 and 1993, 468K sq.m. (622 + 446 -(300*2)) of pent-up space demand has been absorbed. However, the uncommonly high absorption rate will not last longer than 1995.

The under-absorbed office space during the supply constraint year 1988-1991 will be fully made up during 1992-1994. The absorption level soared to 622K sq.m., while the unconstrained absorption level at the given GDP level, is 325K sq.m.

In brief, the pent-up demand will raise the absorption level between 1992 to 1994. By 1995, the absorption level will return normal.

The vacancy rate will increase in the next few years. It would be as high as 43%, if rent deduction has no effect on demand for office space. However, when the high vacancy rate significantly pulls the rent down, the usage of office space will increase; but by how much depends on demand elasticity. The next chapter discusses the demand elasticity analysis and determines how a lower rent affects the vacancy rate.

CHAPTER 3
ANALYSIS OF RENT ELASTICITY

The demand-supply analysis in the last chapter ignores the effect of anticipated rent changes on space demand. This chapter will focus on this effect on demand of office space. How much the rent reduction affects absorption can be represented by a rent elasticity ratio. This chapter will determined the rent elasticity for the Bangkok office market, and explore the effect of rent on the vacancy rate. This will provide an indication of how fast the Thai office market will recover. The first section focuses on the rent elasticity of Bangkok market, followed by the analysis of vacancy rate, in the last section.

ELASTICITY OF BANGKOK OFFICE RENTS

What is a demand elasticity ? In general, at any level of demand, when prices decrease, people can afford to buy more and would like to consume more. However, how much more they would consume depends on many factors. Aside from price, elasticity is determined by the level of consumption necessary to satisfy particular needs and wants. In other words, consumption will not become infinite if prices fall to zero; there is a certain maximum level of consumption to satisfy the market. For example, a couple shares a car together. If a new car price drops to 50% of the original price , they are likely to buy two cars. However, if the new car price drops to 25% of the original price, they will buy only two cars, not four.

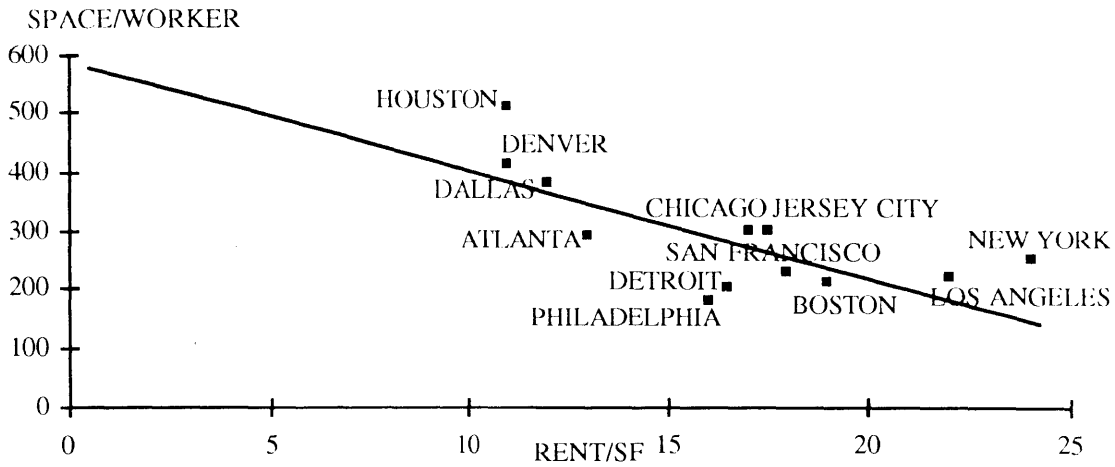
Elasticity is the percentage change in demand per one percentage change in price. The example suggests that elasticity is not constant. Demand elasticity of price reduction to 50% and 25% of original price are 2 (100% / (100-50)%), and 1.33 (100% / (100-25)%), respectively.

RENT ELASTICITY IN AN OFFICE MARKET

The elasticity of demand in office space reflects the percentage of additional space demanded per worker, when rent decreases 1%. Each firm would increase its office space differently , depending on factors such as the future growth of the company, liquidity etc. Generally, tenants will rent more space to reduce the density in the office and prepare for the future growth. The market rent elasticity reflects the overall change in office space demand, aggregating across all firm-specific risk factors.

As mentioned in chapter 2, when rents drop, in the US market more office space will be leased. The additional absorption of office space results in an increase in the office space per worker ratio. Figure 3.1 shows how space per worker increases when rents decrease. In this data, rent elasticity is -0.75.(see Figure 3.1)

Figure 3.1 1990 rent and office space in twelve of the largest US cities.



SOURCE: WHEATON AND DIPASQUALE, DRAFT OF THE ECONOMICS OF REAL ESTATE MARKETS, FIGURE 13.2

It is likely that the similar behavior will happen in the Bangkok office market. Rent reductions will boost the space per worker and the desired space will increase. How much demand is determined by the rent elasticity in Bangkok which is studied in the next section.

METHODOLOGY

Questionnaires were sent out to tenants in the Bangkok office market to gain information about demand elasticity as well as tenant preferences criterion in building selection. Tenants were asked about additional space consumption in response to various levels of rent reduction.(see Appendix 3) All questions are in terms of percentage change. Further details about the survey are in chapter 4.

Many factors are found to influence office space demand, making it difficult to answer the elasticity questions. Even with these problems, a

questionnaire can still yield useful insights because data related to the elasticity of demand in the Bangkok office market is very limited.

ELASTICITY OF BANGKOK OFFICE RENTS

As expected, a number of the respondents to the survey did not answer the elasticity question. Most of these gave reasons for leaving this question blank, and said that various factors influence the decision and rent is not a major criterion. The major criteria cited in these comments were the need for expansion space and the availability of internal financing.

However, 18 out of 40 respondents completed the elasticity questions. Averaging these responses, we have the results in Table 3.1.

Table 3.1 Analysis of the demand elasticity of Bangkok office market

Results from elasticity questionnaire are listed below:

No.	PERCENTAGE OF RENT REDUCTION					
	0%	5%	10%	20%	30%	40%
1	0%	0%	0%	13%	13%	13%
2	0%	0%	0%	0%	10%	10%
3	0%	0%	0%	20%	20%	20%
4	30%	43%	56%	70%	70%	70%
5	0%	0%	0%	10%	20%	20%
6	30%	50%	60%	75%	90%	100%
7	0%	5%	10%	20%	20%	20%
8	10%	20%	30%	40%	50%	60%
9	0%	5%	10%	10%	20%	20%
10	0%	0%	0%	0%	40%	50%
11	0%	0%	0%	20%	30%	50%
12	0%	0%	0%	20%	30%	50%
13	0%	0%	0%	0%	0%	10%
14	0%	0%	10%	15%	20%	25%
15	50%	50%	50%	50%	50%	90%
16	0%	0%	0%	15%	20%	25%
17	25%	25%	25%	25%	40%	50%
18	0%	0%	0%	0%	0%	30%

• PERCENTAGE OF RENT REDUCTION					
0%	5%	10%	20%	30%	40%
• AVERAGE INCREASE IN RENTAL SPACE					
8%	11%	14%	22%	30%	40%
• ELASTICITY OF DEMAND					
N/A	0.59	0.59	0.84	0.78	0.94

Surprisingly, the average of demand elasticity from the survey is very close to 75% [1], demand elasticity of the US market.

The rent elasticity at different levels of rent change is not equal. When price drops by 5%, the elasticity is -0.59. This means that when rent drops 5%, tenants would like to occupy -0.59*-5% = 2.9% more office space. When price drops 40%, the elasticity is -0.94. If rent drops 40%, tenants would like to occupy 37.6% (-0.94*-40%) more office space.

As mentioned above, the question is difficult to answer. Respondents' answers indicated their best guess for space needs given anticipated growth and capital restrictions. It is possible that the survey data could differ from actual behavior. Furthermore, the elasticity is rather high, almost 1. The high volatility could dramatically affect the change in demand. If each elasticity figure from the table is applied, a significant divergence from the true elasticity could occur. To be conservative, the elasticity figures should be smoothed. Therefore, the average elasticity of -0.75 is applied. This figure is equal to the elasticity of demand in the US office market.

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[1] Wheaton W., DiPasquale D., A Draft of The Economic of Real Estate Markets, Prentice Hall, page 8 of chapter 13.

THE EFFECT OF ELASTICITY ON THE OFFICE VACANCY RATE

If all office space in Bangkok is for rent at a discounted price, the vacancy rate will definitely drop. How much it would drop is the next question. The percentage of rent reduction in the future is unknown. Therefore, three scenarios for mild, medium and strong degree of rent reductions have been set up as follows:

Table 3.2 Three different scenarios of rent reduction

YEAR	CUMULATIVE RENTS REDUCTION					
	SCENARIO 1		SCENARIO 2		SCENARIO 3	
	(%)	RENTS	(%)	RENTS	(%)	RENTS
1992		550		550		550
1993	10%	495	20%	440	35%	358
1994	15%	468	30%	385	45%	303
1995	20%	440	40%	330	55%	248

The percentage of rent reductions is estimated based on high volatility of rents in the last few years, from an average of Baht 200 per sq.m. per month in 1988 to Baht 550 per sq.m. per month in 1991.

The rent elasticity can be applied to absorption. Remember that elasticity is the percentage change in demand given a percentage change in price. Given -0.75 elasticity, the 10% rent reduction will increase the desired office space for -0.75*-10% = 7.5%. The negative sign on elasticity reflects an opposite direction of changes. The rent decreases, while the desired space increases.

The rent elasticity reflects the change in the desired office space, not an absorption. Referring to the absorption equation in chapter 2, the desired office space equals -1405 + 6.254 *(GDP $_{t-2}$). Only 59% of the additional desired space is absorbed in the first year. From the example, the 7.5% increase in desired space directly reflects an increase in demand. Absorption will equal 59% of the difference between the new desired space and old occupied space. (a desired space - last year occupied space). The table 3.3 shows the effect of elasticity on absorption in the three scenarios, compared to absorption with no changes in rents.

Table 3.3 : Effect of rent elasticity on absorption

ELASTICITY OF DEMAND -0.75

	NO CHANGES		SCENARIO 1	
YEAR	CUM. RENTS REDUCTION	ABSORPTION ('000 SQ.M.)	CUM. RENTS REDUCTION	ABSORPTION ('000 SQ.M.)
1993	0%	684	10%	578
1994	0%	735	15%	511
1995	0%	792	20%	521
1996	0%	857	20%	489
1997	0%	925	20%	488
1998	0%	998	20%	510
1999	0%	1,079	20%	553
2000	0%	1,165	20%	592
2001	0%	1,256		

	SCENARIO 2		SCENARIO 3	
YEAR	CUM. RENTS REDUCTION	ABSORPTION ('000 SQ.M.)	CUM. RENTS REDUCTION	ABSORPTION ('000 SQ.M.)
1993	20%	705	35%	896
1994	30%	648	45%	748
1995	40%	679	55%	743
1996	40%	590	55%	643
1997	40%	567	55%	617
1998	40%	583	55%	634
1999	40%	627		

When the rent decreases 35%, the absorption almost doubles from that of the original forecast with no rent reduction. A significant number of office space users would be urged to consume more space by a discounted rent. In addition, if the discounted rent is maintained, absorption remains still higher than the scenario with no change in rents. The rent reduction not only stimulate an early absorption, but also permanently increases the absorption level each year in the future as the economy grows.

RESULTS

Besides absorption, the vacancy rate also depends on office space stock in the market. As mentioned in chapter 2, office space stock equals last years office space stock plus this years completions. Due to limited information, the forecast completions figures are available only up to year 1995. To investigate the recovery in the market, I assume that no additional office space will be completed, until the market recovers. Office space stock is held constant until the market recovers. The office space stock figures are shown in Table 3.4.

Given a constant supply after year 1995, the changes in the vacancy rate is shown in Table 3.5.

Table 3.4 Forecast supply of office space in Bangkok

YEAR	CUMULATIVE SUPPLY ('000 SQ.M.)
1992	2,268
1993	3,023
1994	4,495
1995	5,800
1996	6,485
1997	6,485
1998	6,485
1999	6,485
2000	6,485
2001	6,485

Table 3.5 Vacancy rate of four scenarios

Elasticity of Demand -0.75

NO CHANGES

YEAR	ACCUMULATIVE RENT REDUCTION	ABSORPTION ('000 SQ.M.)	OCCUPIED SPACE (OC t) ('000 SQ.M.)	VACANCY RATE
1993	**0%**	**684**	**2,109**	**15%**
1994	**0%**	**735**	**2,555**	**35%**
1995	**0%**	**792**	**2,926**	**43%**
1996	**0%**	**857**	**3,286**	**43%**
1997	**0%**	**925**	**3,672**	**37%**
1998	**0%**	**998**	**4,079**	**30%**
1999	**0%**	**1,079**	**4,514**	**23%**
2000	**0%**	**1,165**	**4,990**	**15%**
2001	**0%**	**1,256**	**5,501**	**7%**

SCENARIO 1

YEAR	ACCUMULATIVE RENT REDUCTION	ABSORPTION ('000 SQ.M.)	OCCUPIED SPACE (OC t) ('000 SQ.M.)	VACANCY RATE
1993	10%	578	2,687	11%
1994	15%	511	3,198	29%
1995	20%	521	3,719	36%
1996	20%	489	4,208	35%
1997	20%	488	4,696	28%
1998	20%	510	5,206	20%
1999	20%	553	5,758	11%
2000	20%	592	6,350	2%

SCENARIO 2

YEAR	ACCUMULATIVE RENT REDUCTION	ABSORPTION ('000 SQ.M.)	OCCUPIED SPACE (OCt) ('000 SQ.M.)	VACANCY RATE
1993	20%	705	2,814	7%
1994	30%	648	3,462	23%
1995	40%	679	4,141	29%
1996	40%	590	4,731	27%
1997	40%	567	5,298	18%
1998	40%	583	5,880	9%
1999	40%	627	6,508	0%

SCENARIO 3

YEAR	ACCUMULATIVE RENT REDUCTION	ABSORPTION ('000 SQ.M.)	OCCUPIED SPACE (OCt) ('000 SQ.M.)	VACANCY RATE
1993	35%	896	3,005	1%
1994	45%	748	3,753	17%
1995	55%	743	4,496	22%
1996	55%	643	5,139	21%
1997	55%	617	5,755	11%
1998	55%	634	6,389	1%

According to a historical data in the Bangkok office market, a minimum vacancy rate in an unconstrained market is 7%, for space maintenance and tenant movement. The Bangkok office market will fully recover when vacancy rate reduces to approximately 7%.

Vacancy and timing of recovery depend on new completions from 1992 to 1995. Of particular importance to the accuracy of the projections is the probability of additions in the uncertain completion group, which is 20% of total expected completions. (refer to Table 2.2). Moreover, the result also substantially depends on the assumption of "0" additional supply after year 1995 which will strongly impact the projected vacancy rate after year 1995.

In scenario 1 when the average rent is slightly reduced no more than 20%, the market is expected to fully recover by year 2001. If the average rent significantly declined as much as 55% of original rent as scenario 3, the Bangkok office market would likely to rebound sometime between 1997 and 1998. But if the rent moderately declines by 40%, the office market should return to a boom period by the year 1998.

The recovery of office oversupply in Bangkok also depends on uncertainty related to the future of Thailand as follows:

1) Future Supply

Two circumstances could occur. Firstly, the actual office completions in the first few years may be postponed. This could lessen the initial effects of oversupply. Secondly, office completion after 1996 could be higher than the assumption. If the amount of space is considerable, the market recovery will take longer.

Since the office market slowed down, a number of new office condominium projects postponed during a construction to prelease space. Some developers have been looking for feasible alternative uses. Therefore, the actual negative effect of oversupply in 1993 is slightly less than expectations of many analysts. If more buildings postpone completion. The market would benefit more.

This analysis assumes that completions of new office space after 1995 is close to zero, until the market recovers. In actuality, some real estate companies still launch new office projects in an oversupplied market. The reasons are a glut of human resources in the company, which cannot be laid off; sunk costs for new projects planned prior to the market decline, and upcoming building permit expirations. Some developers received a permit before the zoning regulation was enacted. Therefore, they would rather start a project now, than let the permit expire. Information about projected supply after 1995 is not yet available. If office space completion after year 1995 is significant, the recovery of the Bangkok office market could take longer than forecasted.

2) Thailand's economic growth:

Forecasts of economic growth between 1993-1997 range between 7 to 8.5% per year which is high relative to the world economy. However, the economy of Thailand largely depends on the world economy, especially the economy of the United Sates and Japan, the largest markets for products made in Thailand.

The Thai economy is sensitive to world economic climate. Therefore, it is possible that the real GDP deviates from forecasts due to external influences of the national economy.

3) Future roles of Thailand in the South East Asia region.

Thailand is located at the center of the Indochina Peninsula. This prime location provides Thailand more advantages to be the commercial center of the Southeast Asia region. Due to a relatively lower standard of infrastructure in countries in Indochina, Thailand is attractive as headquarters for companies who operate in the region. As more foreign investors go to the Indochina region, the demand for office space in Bangkok will increase.

CONCLUSION

Rent elasticity has a significant effect on the recovery of the Bangkok office market. This study examined three rent reduction scenarios to investigate the effect on vacancy rates which are indicative of market oversupply. Three scenarios present rent reductions of 20%, 40% and 55%.

The forecast vacancy rates of all scenarios reach a peak in a range of 22% to 36%. Forecast vacancy rates depend on a constant total supply from year 1996 to the time the market recovers because the data on future completions is limited to year 1995.

The Bangkok tenant survey revealed that the Bangkok office rent elasticity is approximately -0.75. Three scenarios show that the recovery period of the Bangkok office market is expected to be within year 1997 to 2001 , depending on how much the average office rent in the market decreases.

CHAPTER 4
MICROECONOMIC ANALYSIS: RENTS AND OFFICE BUILDING DEMAND

After exploring the aggregate demand-supply conditions in previous chapters, this chapter looks at the Bangkok office from a macroeconomics perspective. By giving a better understanding of the various characteristics of buildings, this chapter determines what attributes substantially influence the rent level. Where is the most desired location? How can a property owner upgrade a building to obtain a higher rent? What kind of amenities are in high demand ?

There are two ways to approach rent analysis:

1) Hedonic Model: It is similar to demand-supply analysis, that rents are analyzed using multiple regression. Multiple regression identifies variables that significantly influence the rent of each building based on historical data.

2) Questionnaires: The advantage of a questionnaire is that it presents not only quantitative data, but also qualitative information relating to tenant preferences. The questionnaires were sent to tenants in Bangkok. The answers include the following information: where tenants want to locate, what kinds of amenities are in demand and what tenant think about rent levels now and in the future.

This chapter starts with the statistical method, the Hedonic Model. The second section draws implications from a comparison of the survey results.

RENT HEDONIC MODEL

Products are generally viewed in two ways by consumers. Some products such as commodities are considered interchangeable because they have identical characteristics. Other products such as clothes and cars are differentiable and therefore are not as interchangeable to consumers. Real estate is extremely product differentiated; even buildings with the same design and amenities can appeal to tenants differently because at a minimum the location will be different. In reality office buildings have a multitude of designs and amenities thus making each one different to tenants. How much value do tenants place on rents of each building? How much do location and amenities influence the rent ? The answers to these questions are derived using multiple regression from the Hedonic model.

DATA:

Data for Hedonic model was obtained from the First Class Office Demand & Supply Survey, dated July 1992, prepared by American Appraisal (Thailand) Ltd.

The data set consists of 36 samples of new office buildings completed during 1992-93. The data includes information on current rents, general characteristics and various amenities of office buildings in the Greater Bangkok Area (as shown in Appendix 4). Building attributes for offices completed before 1991 was not available. Therefore, this data set contains only buildings completed after 1991.

The rents stated represent a landlords' asking rent, and reflect the market willingness-to-pay by tenants, according to the data gatherers. The amenities include the main facilities--number of parking space and

elevators--and extra amenities such as shopping facilities, a heliport, food courts etc. The buildings would have been more clearly differentiated had there been data which included the following information:

a) Unique building characteristics: such as shape of the site, architectural design.

b) Tenant mix: The mixture of uses affects the demand for parking spaces due to synergy among uses. For example, office parking is full during day time, while shopping plaza parking reaches a peak in the evening and weekends. If both uses are present, a building needs less parking spots because office and shopping uses have synergy in parking.

c) Sublocation: Street and substreet locations in the same block have different land values. Therefore the affordability in providing parking spaces is different.

d) Neighborhoods: Surrounding neighborhood are also important, particularly how much and what kind of amenities a neighborhood can offer the office buildings; for example, restaurants, convenience stores etc. This information was not available in the data sets, therefore, the correlation of these service to rents is difficult to determine.

In the data set used, a number of variables need further explanation. Definitions are listed below:

- Density: Gross floor area / land area
- Distance from CBD: The distance from Silom and Sathorn district to the subject building's location.
- Food facilities: Included are all kinds of food services--canteen, food centers and restaurants.

•Location are divided in to 5 zones which cover the Bangkok area as follows:

1) Central Business District (CBD) : Krungthonburi, Sathorn, Silom, Suriwongse, Charoenkrung, Rama 4 (West of the Expressway), Rama 1, Rajadamri, Wireless and Ploenchit

2) Sukhumvit Area: Rama 4 (East of the Expressway), Rachadapisek (Rama 4 to Sukhumvit), Asoke and Petchaburi.

3) Phaholyothin Area: Payathai, Sri-Ayuddhaya, Phaholyothin, Vibbhavadee-Rangsit.

4) Rama 9 Rd. Area: Rama 9, Asoke Dindang, Rachadaphisek, Tiem-Ruam-Mitr.

5) Other Areas: Suapa, Chan, Teechavahich, Yukol 2, Bangna-Trad, Srinakarin, Sanpawuth, NaRanaong, Rama III, Chaengwattana, Ramindra.

METHODOLOGY

Based on historical data, a Hedonic price equation was created which explores a relationship between office market rents and office building attributes.[1] Building attributes include anything that might influence rents such as a location, height of the buildings, size of units, parking per area ratio, heliport, and sports facilities. Using the estimated Hedonic equation, a rental index is calculated over time for "typical" lease terms in "average" locations for each zone. What is reported then is an estimate of what the

1 DiPasquale Denise and Wheaton William C., a draft of the ninth chapter of The Economics of Real Estate Market, Prentice-Hall, p15

"average" rent would be.[2] The advantage of using a Hedonic model is that it is possible to isolate the influence of one factor by holding other factors constant.

During the data input process, some characteristics are considered simply on the basis of whether they are available or not, instead of trying to establish a linear relationship. For example, the model does not discuss how many heliports or supermarkets available, but whether a heliport or a supermarket is available. For this type of information, the input is in a form of " a dummy variable" which is expressed as a "1" or "0", like, "Yes" or "No". This method was also applied to five different locations: CBD (Silom), Sukhumvit, Phaholyotin, Rama 9, and other area.

Numerous variables were tried when formulating the Hedonic equation. The statistically insignificant variables were eliminated in order to arrive at the best variables for the equation.

After scanning through the data set, three extraordinarily high car park/area ratios were discovered and therefore were excluded from the data set. These buildings--Sinthorn II, Bangna Tower and ThongKham Mini Office and Tower-- have extra parking space for either future projects for other adjacent or existing buildings. Also excluded were car park/ area ratios for all mixed use projects--where much of the parking is allocated for non-office activities.

RESULTS

After trying various independent variables, the best rent equation was determined to be the following:

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2 Torto R.G., and Wheaton W.C., Office Rent Indices and Their Behavior Over Time, Center for Real Estate Development, Massachusetts Institute of Technology, Working paper 41, 1992, p.5

Rent = 535 + 90.91 (Dummy location CBD)
+ 68.56 (Dummy location Sukhumvit)
- 7.02 (Distance from CBD) - 16.98 (Density)
- .00005 (Salable Area) + 2335.2 (Car / area)
+ 345,340 (Elevator/area) - 59.24 (Dummy computer)
+ 10.40 (Dummy bank) -19.84 (Dummy food facilities)
+ 85.70 (Dummy heliport) + 63.07 (Dummy shopping plaza)
- 43.58 (Dummy supermarket) + 10.73 (Dummy sports)
- 57.12 (Dummy business center)

Statistically, the above noted equation is only a fair estimate of office rents, given the availability of details of building attributes. The statistical result of this rent Hedonic equation is shown on Table 4.1.

Table 4.1 Rent Hedonic Model

Regression Statistics

Multiple R	0.8563
R Square	0.7333
Adjusted R Square	0.5333
Standard Error	84.2130
Observations	36

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	15	389969.0386	25997.9359	3.6659	0.003839667
Residual	20	141836.517	7091.82585		
Total	35	531805.5556			

	Coefficients	*Std Error*	*t Statistic*	*P-value*
Intercept	535.32	101.3930063	5.2796	6.9E-06
LOCATION CBD	90.91	48.08690769	1.8906	0.06698
LOCATION SUKHUMVIT	68.56	47.59371903	1.4405	0.15862
DISTANCE FROM CBD	-7.02	3.686904196	-1.9050	0.06503
DENSITY	-16.98	8.932634654	-1.9008	0.06558
SALABLE AREA	-0.00005	0.000563173	-0.0906	0.92833
AMENITIES :				

DUMMY MIXED USED*				
CAR/AREA	2335.20	1968.809064	1.1861	0.24357
ELEVATOR/AREA	345340.46	246911.5344	1.3986	0.17072
COMPUTER CENTER	-59.24	65.16803836	-0.9090	0.36956
BANK OR ATM	10.40	38.99921465	0.2667	0.79127
FOOD FACILITIES	-19.84	52.176037	-0.3803	0.70601
HELIPORT	85.70	47.69519786	1.7969	0.08098
SHOPPING PLAZA	63.08	48.20735383	1.3085	0.19924
SUPERMARKET	-43.58	66.81854675	-0.6522	0.51853
SPORTS FACILITIES	10.73	40.78839254	0.2630	0.7941
BUSINESS CENTER	-57.12	55.84406598	-1.0228	0.3134

Statistical Evaluation :

Variables are categorized into three groups based on their relative level of significance in determining rent. The variables which were mostly significant are ranked as follows:

1) Distance from CBD
2) Density
3) Location CBD
4) Heliport

Other variables with moderate significance were: Location Sukhumvit, Elevator/area, Car park/area, and Shopping plaza. All of these correlated positively to rent.

Although other variables did correlate with rent, they were found to be statistically insignificant.

Interpretation :

Location is the major indicator of rents, evidenced by a high correlation of the dummy variable for location CBD, distance from CBD and a dummy variable for location Sukhumvit. Perhaps this is because tenants want to be in the central business district in order to be more

accessible to clients. It is important to remember that the definition of the CBD in this data set covers a large area in downtown Bangkok. The questionnaire in the next section narrows down the preference for a CBD location to more specific areas. Office rents in the CBD area have an average of Baht 91 higher than the identical space located in suburb areas. In terms of distance, every additional kilometer closer to the Silom district meant that the rent is Baht 7.02 higher, holding other variables constant.

Density of the project is another significant factor in determining rent. According to the results, Thai companies do not like high density buildings. In fact, the higher the buildings are, the less the average rents turn out to be. It is possible that Thai business people are concerned about fire escape systems and the limited capability of the city fire department in being able to serve high rise buildings. It appears that Thai businesses also value open space, as well, since higher density buildings usually have a larger footprint relative to land area.

The results show that tenants also concerned about parking facilities and elevators. The positive coefficient of both facilities ratios per area demonstrate tenants' appreciation of these amenities.

In addition, the results also indicate that Thai tenants appreciate having a heliport and a shopping plaza. This result is consistent with the serious traffic problems in Bangkok. Many tenants would rather go shopping directly from the office instead of struggling in traffic. Furthermore, in case of emergency, people are more likely to get to a hospital in time by helicopter, rather than via an ambulance which would have to go through the traffic in Bangkok.

Other amenities such as food facilities and a supermarket also depend on support from the surrounding neighborhood. It does not mean that they are insignificant, but the data is not available.

Many independent variables, which were eliminated due to a lack of statistical insignificance, are listed below:

- Year completion. The buildings in the data set were completed during the same period. Therefore, the year of completion did not have significance.
- Number of stories. This variable was well substituted by density.
- Office area. Both number of stories and density represented the floor area of a building. Therefore, this variable was dropped off.
- Rent of additional car parking. Due to a narrow range of car park rents, no significant effect on office rents was determined.
- Effect from new car park regulations, effective in February 1992, was taken into account. These regulations stipulate that an office building has to provide at least one parking space per every 60 sq.m. of office space. There was no significant effect.
- Elevator /floors: This dummy variable was used to investigate how a fat or thin shape of the building might affect rents. It was also used to determine whether elevators as an amenity was significant in determining rents. The results concluded that in either case this variable was not significant.

QUESTIONNAIRES

After deriving the major factors that influence rents by using the econometric method, this section investigates rents on the basis of information taken directly from interviews collected through questionnaires.

The results from the questionnaire are different from the conclusions derived through the econometric model in two ways : (1) Questionnaires include a tenant's expectations and perceptions of the future which may different from trends based on historical data; (2) The survey contains both quantitative and qualitative data, whereas the econometric model only involves quantitative data.

OBJECTIVE

The questionnaire was designed to help Thai business people develop office space that better meets the needs of the Bangkok office market. The information concentrated on four major areas: locational preference, amenities, demand elasticity and rent affordability.

The questionnaires were targeted at tenants in the Bangkok Metropolitan area. The respondents were selected from middle to high levels of management and were people who had authority or an understanding about selecting office space.

When first considering creating the questionnaire office ownership was considered. However, owning office space is not popular in Bangkok, and therefore, questions about office space ownership were eventually not included in this study.

The questionnaire is in Appendix 3.

METHODOLOGY

In total, approximately fifty questionnaires were sent directly to tenants in Bangkok, utilizing personal connections. Forty surveys were returned. The respondents were grouped according to occupancy as follows:

Trading	4
Consulting	9
Producers	9
Financial institutions	6
Real estate companies	6
Telecommunication	2
Others	4
	40

Incomplete questionnaires were partly used, depending on availability of answers. Therefore, the number of responses to different questions many differ in cross tabulations. Due to limited time, a pre-test of the questionnaire was impossible.

RESULTS FROM QUESTIONNAIRES

The raw data from 40 returned questionnaires is shown in Appendix 4.

1) **Tenants' Criteria for Office Selection**

The questionnaires listed 14 different criteria for tenants to rank according to the degree of importance when selecting office space. The outcome is shown in Table 4.2.

Table 4.2 Criterion in Selecting the Office Building

RANK	CRITERION	SCORE
1	CLIENTS' CONVENIENCE	106
2	SUFFICIENT PARKING SPACES	106
3	WELL PERFORMED PROPERTY MANAGEMENT	92
4	LOW TRAFFIC CONGESTION	80
5	EASY ACCESS TO PUBLIC TRANSPORT	75
6	GOOD ARCHITECTURAL DESIGN	69
7	CONVENIENT FACILITIES	60
8	NEAR THE SAME PROFESSIONAL DISTRICT	58
9	NEAR THE SILOM DISTRICT	56
10	NEAR STAFF'S RESIDENTIAL AREA	53
11	GOOD RESTAURANTS AND AN EXECUTIVE CLUB	47
12	ACQUAINTANCE TO THE PROPERTY OWNER/AGENT	46
13	HIGH RISE BUILDING	43
14	CLOSE TO DEPARTMENT STORES	41

NOTE: VOTES ARE WEIGHTED BY:	WEIGHT
VERY IMPORTANT CRITERION	3
RATHER IMPORTANT CRITERION	2
MINOR CONCERNS	1
NOT IMPORTANT	0

The highest ranking criteria was clients' convenience and the second highest rank was parking. These were followed by property management, traffic and transportation factors. Although amenities added some desirability, tenants viewed these with less importance. These results were consistent to those derived in the Hedonic model.

The next highest criterion was the design of the building which reflected a tenant's desire to locate in buildings with prestige and a good image. Both the questionnaires and the Hedonic model supported the theory that tenants like low rise buildings. In comparison to the height of shophouses, it is possible that Thai tenants prefer low rise buildings rather than skyscrapers.

Furthermore, it is noted that the performance of property management is fairly important, as a criterion for office space selection.

For an existing building, property management was considered very important in attracting new tenants. More on this will be discussed in chapter 5.

2) **Location**

Locations in the questionnaire were defined differently from that in the Hedonic model. The zones were narrowed down to investigate particular areas more precisely. The CBD area according to macroeconomics analysis was divided into the Silom area and Wireless Rd. area. This is further explained in the questionnaire in appendix 3.

Unlike most other cities in the world, the most desired location for tenants is not right in the CBD, but in area B which is next to the CBD. Area B covers Wireless, Ploenchit, Chidlom, and Rajadamri areas. (See Table 4.3)

Table 4.3 The most desired location: allocated by the present location.

PRESENT LOCATION	A	B	C	D	E	Grand total
A	10	3	1	0	0	14
B	1	7	0	0	0	8
C	2	4	6	0	1	13
D	0	0	0	2	0	2
Grand total	13	14	7	2	1	37

RANKS OF THE MOST DESIRABLE LOCATION

RANKS	AREAS	SCORE
1	WIRELESS RD. AREA (B)	118
2	SILOM AREA (A)	104
3	SUKHUMVIT AREA (C)	89
4	PAHOLYOTHIN AREA (D)	46
5	RAMKAMHANG AREA (E)	12

NOTES: A) Location
A For Silom area (CBD)
B For Wireless Rd area

C For Sukhumvit area
D For Phaholyothin area
E For other areas

B) Votes are weighted as follows:

Most desired location	4
Second desired location	3
Third desired location	2
Forth desired location	1

Although most tenants are happy with their present location, many of them are willing to move to area B. 21% of the tenants located in the CBD area want to be in area B, while only 12.5% of the tenants in area B want to move to the CBD area. Moreover, existing tenants in area C want to move to area B more than the CBD area

Area B may have become more popular due to 2 major reasons: less traffic and land availability for future development. First of all, the traffic is more congested in the CBD area than in area B. A greater number of road connections to major roads and expressways, which directly link to major residential areas, creates a smoother flow of traffic in area B than in the CBD. Tenants are also concerned more about convenience to clients , which is also influenced by traffic problems. Therefore, the demand of office space has shifted to B from the CBD. In addition, more land is available for future expansion in area B, while the CBD area is fully built out. It is almost impossible to demolish a large piece of land in the CBD. New development requires deconstructing existing buildings and generates additional problems related to neighborhoods and zoning. Therefore, many of new office condominiums projects, which are high quality, are on Wireless Rd. (area B).

The rank of location, desired by type of business is listed in Table 4.4.

Table 4.4 Desired Location Classified by Type of Businesses

TYPE OF BUSINESS	1st DESIRE	2 nd DESIRE	3rd DESIRE	4th DESIRE	5th DESIRE
CONSULTING	B 2.86	C 2.71	A 2.43	D 2	n/a
FINANCIAL INSTITUTE	A,B 3.5 each	n/a	C 3	D 0.88	E 0.13
PRODUCER	B 3.83	A 2.33	C 2	D 1.67	E 0.17
REAL ESTATE	B 2.86	A 2.57	C 2.43	D 1.14	E 1
TELECOMMUNI-CATION	B 3.5	A 3	C 2.5	D,E 0.5 each	n/a
TRADING	A 3	B,C 2.67 each	n/a	D 1.67	n/a
OTHERS	A,B,C(3) 3 each	n/a	n/a	E 0.5	D,F 0.25 each

Notes: Location A For Silom area
B For Sukhumvit area
C For Phaholyothin area
D For Ramkamhang area
E For other area.
Scores Range from 4 to 1 from most desirable location to the forth desirable location.

All types of business, except trading, considered area B as the first choice. Financial institutions also chose CBD as the most desirable office location. Trading companies preferred to stay in the CBD, as well.

It is interesting that consulting firms do not want to be in the CBD area, as evidenced by their choosing the CBD area as the third most desired location after areas B and C.

The attractiveness of area C, which covers Sukhumvit, Asoke, Rajadaphisek and Petchaburi, is coming close to area B and to the CBD

area. Area C is in the eastern part of Bangkok. As mentioned in chapter one, this location is where the majority of development has moved to.

Area D , located in the northern part of Bangkok, is clearly less attractive to businesses than area C.

3) **Amenities**

From the open question concerning what additional amenities tenants required in their buildings , the answers are listed in Table 4.5.

Table 4.5: Amenities Suggested by Tenants

Under the question that " What would tenants like to have in addition to the existing amenities in the office building?" The result is shown as follows:

RANK	SUGGESTED AMENITIES	PERCENTAGE OF COMMENTS
1	FOOD CENTER	22%
2	SPORTS CENTER	18%
3	POST OFFICE	8%
4	TAXI STAND	8%
5	SUPERMARKET	4%
6	BANK AND ATM MACHINE	4%
7	SALON	4%
8	NURSERY	4%
9	NICE OPEN SPACE/ GREEN AREA	4%
10	CAR POOL ARRANGEMNET	4%
11	CAR CLEANING SERVICE	4%
12	MEDICAL CLINIC	2%
13	DRY CLEANER	2%
14	MESSENGER SERVICE	2%
15	SWIMMING POOL	2%
16	EQUIPPED CONFERENCE ROOM	2%
17	CENTRAL SECIRITY SERVICE	2%
18	ADVANCED TELECOMMUNICATION SYSTEM	2%
		100%

Due to the serious traffic problems in Bangkok, working people tend to spend more time in the office to avoid traffic delays. Activities related to daily life, therefore, become increasingly important. Food centers and

sport facilities are in high demand because locating these facilities near office offer employees alternatives to travel.

4) **Rent Affordability**

Questions about rent affordability ask about three rents : present rent, affordable rent , and expected rent . The outcome is very interesting, as shown below: (see Tables 4.6, 4.7 and 4.8)

Table 4.6 Present Rent Classified by Type of Business

RANK	TYPE OF BUS.	PRESENT RENT				
		0-200	200-300	300-400	400-500	500-600
1	TELECOM.	0	0	0	0	1
2	FINANCIAL INS	0	0	0	1	4
3	OTHERS	0	0	0	1	3
4	REAL ESTATE	0	1	0	3	2
5	PRODUCER	1	0	1	0	2
6	TRADING	0	0	1	1	0
7	CONSULTING	1	1	3	1	0

RANK	TYPE OF BUS.	PRESENT RENT			AVERAGE
		600-700	700-800	800+	RENT
1	TELECOM.	0	0	1	**700**
2	FINANCIAL INS	1	0	0	**550**
3	OTHERS	0	0	0	**525**
4	REAL ESTATE	0	1	0	**493**
5	PRODUCER	1	0	0	**450**
6	TRADING	0	0	0	**400**
7	CONSULTING	0	0	0	**317**

MEDIAN **493**

Table 4.7 Willingness to Pay For Rent Classified by Type of Business

RANK	TYPE OF BUSINESS	RENTS LEVEL						AVER-AGE RENT
		200-300	300-400	400-500	500-600	600-700	700-800	
1	TELECOM	0	0	0	0	0	1	**750**
2	FINANCIAL INSTITUTES	0	0	2	2	2	0	**550**
3	TRADING	0	0	1	0	1	0	**550**
4	PRODUCER	1	0	2	0	2	0	**490**
5	REAL ESTATE	0	1	2	2	0	0	**470**
6	OTHERS	1	0	0	2	0	0	**450**
7	CONSULTING	0	2	3	0	0	0	**410**
								MEDIAN 490

Table 4.8 Expected rent Classified by Type of Business

RANK	TYPE OF BUSINESS	RENTS LEVEL						AVER-AGE RENT
		200-300	300-400	400-500	500-600	600-700	700-800	
1	TELECOM	0	0	0	0	0	1	**750**
2	REAL ESTATE	0	2	0	1	2	0	**510**
3	FINANCIAL INS	0	2	1	1	2	0	**500**
4	TRADING	0	0	1	1	0	0	**500**
5	OTHERS	0	1	1	1	0	0	**450**
6	PRODUCER	1	0	2	2	0	0	**450**
7	CONSULTING	0	4	1	0	0	0	**370**
								MEDIAN 500

NOTE:
OTHERS CONSIST OF A SHIPPING AGENCY, A FOREIGN SPECIAL PROJECT, A CONSTRUCTION COMPANY, AND AN ARCHITECT FIRM.

At present, tenants pay Baht 493, while they can afford Baht 490. They expect to pay Baht 500. According to the results, tenants are willing to pay slightly less than a current market rent. However, they expect to pay the current rent level. Tenants are not aware that a rent reduction is likely to come in near future. However, they can afford what they are

paying now. It will be interesting to see how tenants react once they realize rents will fall.

Who can afford the most ? According to the table 4.7, telecommunication and financial business can afford the highest rent level. In addition, financial businesses expected to pay less rent than real estate companies. Consulting firms can afford the lowest.

It is more interesting to learn that each type of business, except real estate businesses, expect to pay less than the rent level that they can afford.

CONCLUSION

The factors that influence rents can be determined by two methods: Hedonic equations and questionnaires.

The advantages of both methods are: a Hedonic model is a systematic way to calculate the rent for any office building, and hence real estate values of buildings attributes. Questionnaires on the other hand give qualitative information about tenants valuation of these attributes.

Both techniques yield similar results. In Bangkok, the key factor is convenience which is primarily reflected by location and parking facilities. There is low value placed on high density. Many amenities are not highly valued by tenants, except for heliports and shopping facilities.

CHAPTER 5
CONCLUSION AND STRATEGIES

The Metropolitan Bangkok office market has undergone rapid growth and is entering an over built stage. A tremendous amount of new office space will enter the market between 1993 and 1995. This fierce competition will lead to a significant reduction in rent, which is an important factor in determining the overall market occupancy rate.

A demand-supply analysis, therefore, is needed to take into account the rent reduction effect. An elasticity of demand analysis is used to determine the forecasted vacancy rate.

The analysis suggests that the market should recover sometime between 1997 and 2001. In the extreme case in which rents do not decline, the forecasted vacancy rate can be as high as 43%. In reality, rent will decrease and boost up the space per worker ratio, which will ultimately increase the demand for office space. Therefore, the vacancy rate is unlikely to be higher than 35%.

Due to tenants' preference to locate near Wireless, Chidlom and Ploenjit roads (area B) and Silom road. (CBD), it will be easier for these areas to find tenants. The vacancy rates in these areas will be lower than the average vacancy rate of Bangkok.

In addition, because Thailand has a good future economic outlook, as indicated by the consistent high growth in GDP, the net effect from oversupply in the market will not be as strong as what had happened in the office market in other countries, such as the United States .

Considering that Thai businesses are used to a shophouse, there might be an opportunity for office buildings, which combine both the low rise characteristics of shopshouses and the convenience of modern office buildings. However, the additional rent gained from having low rise characteristics might be wiped out by a higher land cost per space unit. Further study about optimum Floor Area Ratio(FAR) would be appropriate.

The next section will explore alternatives for how Bangkok will survive through an expected 35% vacancy rate.

• **Property owners should lower rents, but not sign a lease contract longer than 5 years.** During a distressed market, landlords have to sell space at a discount rent. To minimize the impact of the low rent period, a lease contract should not extend through the recovery period.

• **Real estate firms should maintain high liquidity.**

When buildings cannot generate sufficient cash flow as should be expected due to rent reductions and other promotions, liquidity becomes a crucial problem.

Besides supporting liquidity from equity injections and borrowing directly from banks, additional funds can be raised through these methods:

a) Maximize cash flow from prime properties and if necessary, divest second-tier properties. When firms have a serious liquidity problem, it is worthwhile to sell second-tier assets, even at a cheap price, to keep good properties going.

b) Reduce fixed assets by sale and leaseback method. A lump sum of money would flow into the business during a distressed period. The firm will be able to buy the property back in the future when money is available.

c) Form joint ventures with foreign investors or institutes such as insurance companies, and pension funds to finance a new project.

• Desired amenities will attract new tenants.

The key to changing a troubled asset to a marketable asset is to provide "what tenants need", to create a perception as a special place for tenants.

As mentioned in previous chapters, the life-style of people in Bangkok has been changing. Traveling is difficult. Tenants need new amenities that provide more convenience without traveling. Food centers and sports club are the tenants' most desired facilities. Some amenities such as a heliport, car wash service, messenger service provide more convenience to tenants without high cost to the landlord.

• Landlords should emphasize the quality of a property's management service. As a result of the questionnaire in chapter 4, Thai tenants ranked the quality of management service as the third criterion in selecting an office space. Quality of management as well as amenities are a magnet to keep existing tenants in place.

• Next 3-4 years is the best time for both developers and investors with significant capital to buy buildings at a low price, which can be sold during a boom market at a high price.

" A downturn in the development cycle is the best time to pick up troubled projects, position the company with land purchases or options... and /or concentrate on third party fee business. It is the time to get one's company ready for the good development times. It is also the time to buy (rather than make) existing real estate products to create value through better management or just a good purchase price."[1]

Developers can buy existing properties that can be improved by renovation, tenant mix, lease restructuring, and financial restructuring. This work will keep staffs in development firms busy until the market recovers. When the boom period comes back, these properties can be sold at a high price.

• It is a good opportunity for real estate companies to diversify vertically into non-development real estate activities.

In the next few years, there will be no demand for new office buildings in the Bangkok market. The demand will shift to consulting services through an increment of takeovers, foreclosures, and financial restructurings, in which the existing supply in the Bangkok market will not be enough to serve demand. If real estate companies clearly define themselves on what kind of business they are in--in the real estate business, not development business; they will find a great opportunity to expand to nondevelopment businesses such as asset management, leasing and consulting. In addition, this alternative to diversify businesses will

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1 Leinberger, Christopher B. " Developer Should Broaden Their Job Description", National Real Estate Investor, December 1987, p.48

generate work to staff in real estate development firms. Without this additional work, the human resource can be a burden for developers; especially since lay-offs are not common in Thailand.

• Loan forbearance is necessary.

Many properties with a high debt structure will get into a lot of trouble, due to a liquidity problem. However, as mentioned in chapter 3, the market should recover in a short time, anytime between 1997 and 1999. Therefore, the bank should not foreclose on the project, but lend support to a property owner to survive untilt the up turn cycle.

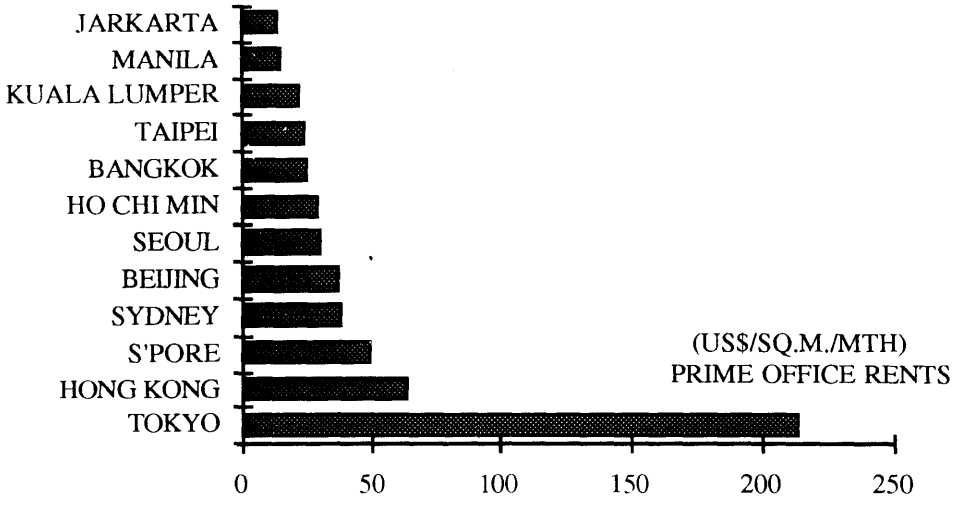
Banks can help a building owner by restructuring a loan, doing a work out, and forming a joint venture business with real estate companies.

• Government should stimulate investment.

A good investment environment, such as low interest rates, is essential to maintain a GDP growth level, which is the main influence on the demand for office space year after year.

Low production costs, stable currency , and cheap office rent in Bangkok , relative to other countries. (see Figure 5.1) can attract foreign investors, who will increase demand for office space.

Figure 5.1 Rent and price comparison to other countries



Notes : Rents as of November 1992.

As of April 1993, rents in Bangkok dropped to US$ 20 /sq.m./mth[2].

Source: Brooke Hiller Parker (Hong Kong)

Office rent in Bangkok is half the price of rent in Singapore, and cheaper than rent in Ho Chi Min city. In the next few years, rents will fall even more. Office rent in Bangkok will be very cheap, relative to other cities. Thailand also provides a convenience for businesses to connect to a possible large source of extraordinary cheap labor and resources in Vietnam, Laos and Cambodia.

A problem that obviously harmed the investment environment in Thailand is an insufficient infrastructure, which is extensively realized, but is slowly being solved through a complicated process. In order to maintain Thailand's investment attractiveness, quick government reaction is necessary.

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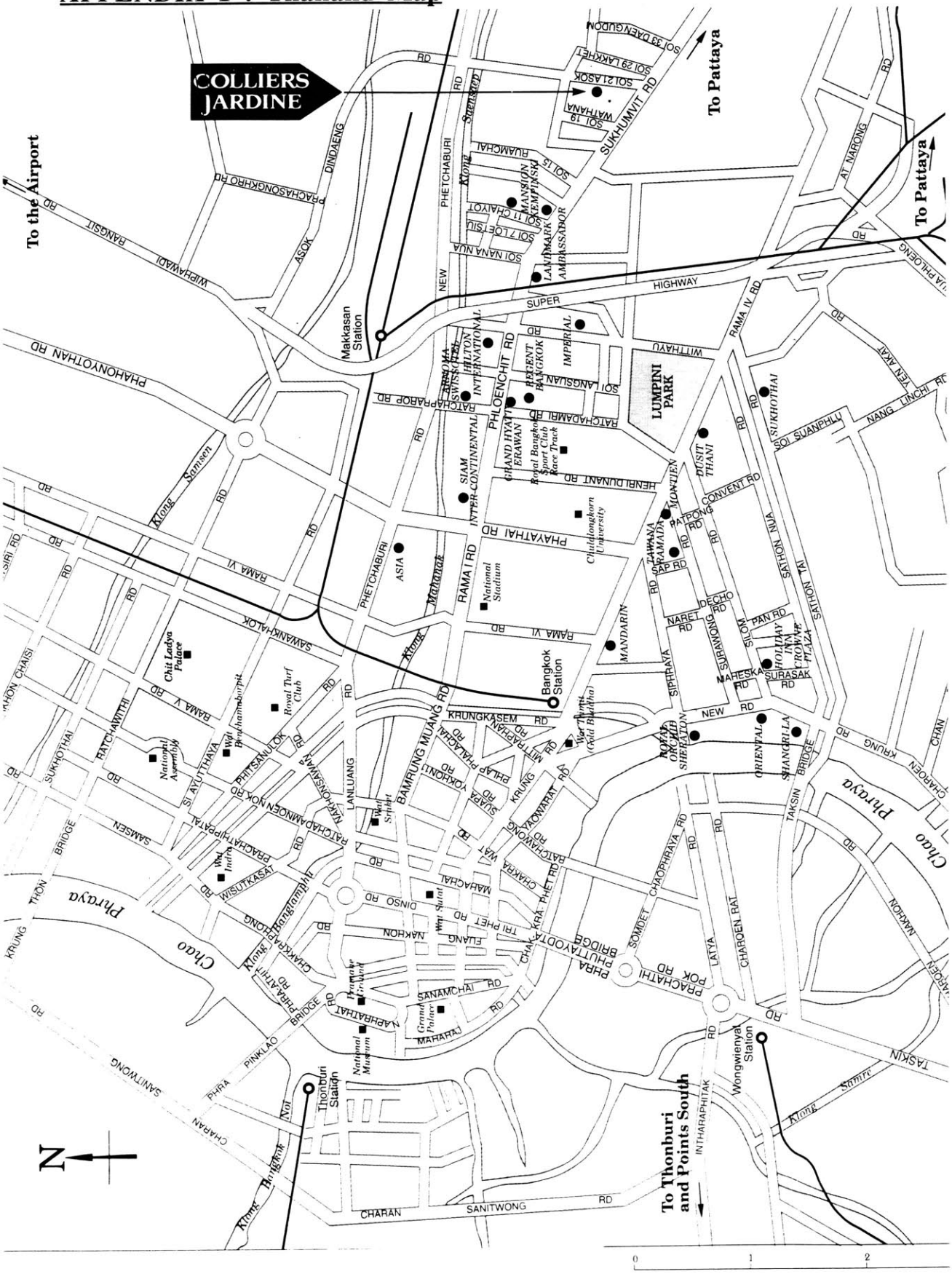
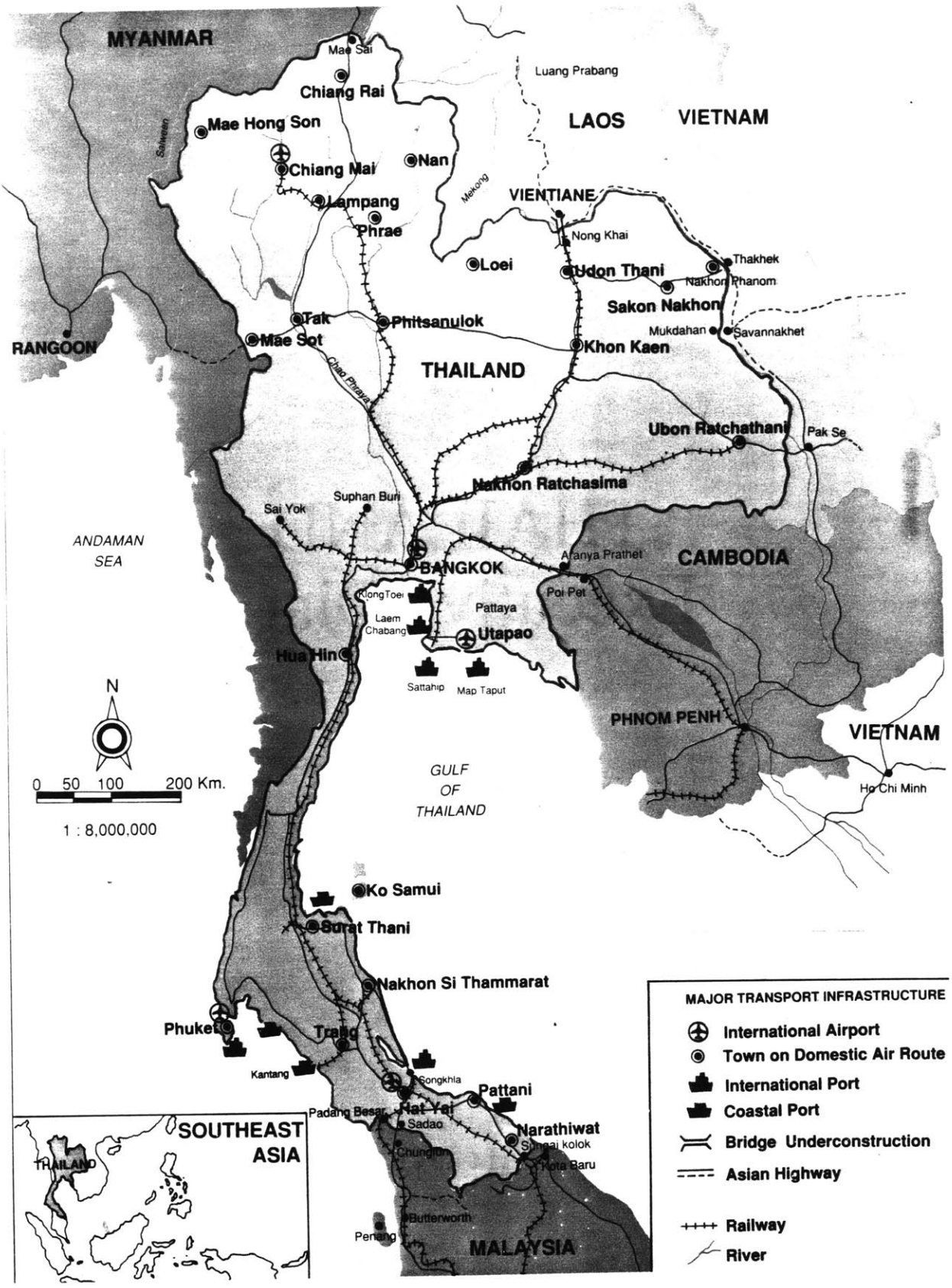
2 Colliers Jardine (Thailand), Commercial Office Property Market: Bangkok, June 1993.

APPENDIX 1 : Thailand Map



APPENDIX 2 : Bangkok Map



APPENDIX 3 : Questionnaire for Tenants in the Bangkok Office Market.

Part I : Location

1) Location Preference

Suppose that your firm can be located in wherever it wants to be in Bangkok Metropolitan area. Where is your firm's want to locate in?

Please use "1" to indicate the place that you most likely to be, "2" for the second most likely location, "3" more the third most likely choice, and "4" for the forth most likely choice.

	Area Ref.
____ Surawong, Silom, Sathorn, Sipraya	A
____ Wireless, Ploenchit, Chidlom, Rajadamri	B
____ Asoke, Sukumvit, Petchaburi, Rajadaphisek	C
____ Paholyothin	D
____ Ramkamhang, Srinakarin	E
____ Other (please specify)_____	F

2) Refer to the list above, please mark down the location of your present office. _____

3) Please indicate the degree of importance of each factor in your selection of office location.

Circle: 4 for the **most important** factor in your decision.
3 for a **major** factor in your decision
2 for a **minor** concerns
1 for **not even think about it.**

A) Location is not in a congested traffic district.	4	3	2	1
B) Buildings' developer is a good friend with the firm.	4	3	2	1
C) Location is near Silom district	4	3	2	1
D) The building should be skyscraper.	4	3	2	1
E) The site is near department stores.	4	3	2	1
F) The site is near staff's residential area.	4	3	2	1
G) A convenience of customers.	4	3	2	1
H) It is easy to access to a bus.	4	3	2	1
I) It locates near the same professional district.	4	3	2	1
J) The building has a good management team.	4	3	2	1
K) Plenty of parking is available.	4	3	2	1

L) It has an exclusive club and restaurant.	4	3	2	1
M) It has other convenient amenities such as restaurants, dry cleaner, bakery, florist, etc.	4	3	2	1
N) A gorgeous design.	4	3	2	1

Other reasons (Please add)_____

4) What would you like to have as an additional amenities in the office condominium? (For example, car pool arrangement service, shower room, taxi stand)

_____

_____

Part II Firm Characteristics

I would like to ask about your firms to help an interpretation of results.

1) What kind of business is your firm in?
   a) Trading
   b) Services included CPA, lawyer, and consulting
   c) Manufacturing
   d) Banking and financial services.

2) How many people work in your firm? The count should reflect the total number of desk? _____

3) How long has your firm established?
   a) 0-3 years ago
   b) 3-6 years ago
   c) More than 6 years ago.

4) How long has your office been at its present address?
   a) 0-3 years ago
   b) 3-6 years ago
   c) More than 6 years ago.

5) What is the approximate sq.m. of your office space?
_____ sq.m.

6) How many floors is your current office building? _____ floors.

7) Can your firm be described as a group company/ branch/ joint venture/ partnership with foreign base firms? (Please circle) Yes. No.

If your firm rents the office, please answer questions 8-9, otherwise please skip to part III

8) Please circle the categories that best describe the sq.m. rental price/ month of your office.

a) Under Baht 400
b) Baht 401-500
c) Baht 501-600
d) Baht 601-700
e) Baht 701-800
f) More than Baht 800

9) How long is your lease term?

a) 1-2 years
b) 2-4 years
c) 5 years
d) more than 5 years. Please specify _____

Part III : Your Future Plan

1) Do you plan to have an extra office space for the growth of the firm?

____No
____ Yes. If yes, how much additional space would you **need**, as a percentage of existing space? _____ %

2) If yes, how will you get the additional space?

a) purchase
b) lease

If you **rent** the office, please answer questions 3-5

3) What is the maximum price that your company is **willing to pay** for the office space rent (Baht/ sq.m./month)?

a) Under Baht 400
b) Baht 401-500
c) Baht 501-600

d) Baht 601-700
e) Baht 701-800
f) More than Baht 800

4) How much rent does your firm **expect** to get when you renew the lease, given the current market condition?
a) Under Baht 400
b) Baht 401-500
c) Baht 501-600
d) Baht 601-700
e) More than Baht 701

5) When the rent drops, how much additional space each firm would lease are different due to various reasons and degree of needs. For example, preparing for future growth, providing more rooms for worker etc.

If a left column is a percentage decline in rent, how much percentage of additional space **will you rent**? (For example 30%, 100% of existing space)

If the rent drops for rent	Additional space you would
0%	_____%
5%	_____%
10%	_____%
20%	_____%
30%	_____%
40%	_____%

6) Will you consider to buy the space, instead of renting ?
a) No, I will not.
b) Yes, what is your benchmark?_____
_____

If your own the office, please answer question 7-8

7) If the price of the building drops, will you consider to expand your office space? How?
a) No, I will not expand.
b) Yes. By purchasing new office space.
c) Yes. By leasing.

8) When the building price drops, how much additional space each firm would purchase are different due to various reasons and degree of needs. For example, a good investment, preparing for the growth etc.

If a left column is a percentage decline in office price, how much percentage of additional space **will you buy**? (For example 30%, 100% of existing space)

If the price drops for buy	Additional space you would
0%	_____%
5%	_____%
10%	_____%
20%	_____%
30%	_____%
40%	_____%

Thank you for your cooperation. I appreciate your help.

APPENDIX 4 : Buildings Attributes - Data for a Hedonic Model

NO	NAME	LOCATION	AVERAGE RENT/MTH (BAHT/SQM)	DUMMY MIXED USED PROJECT (MIX =0)	LOCATION CBD
1	BUBHAJIT	SATHORN	800	1	1
2	HARINTHORN TOWER	N SATHORN	825	1	1
3	BISCO TOWER	SUB RD, SURIWONG	750	0	1
4	LUMPINI TOWER	RAMA IV	575	1	1
5	PLOENCHIT TOWER	PLOENCHIT	675	1	1
6	SATHORN CITY TOWER	S SATHORN	700	0	1
7	SATHORN SIAM CENTER	S SATHORN	675	1	1
8	SETHIWAN TOWER	PAN	650	1	1
9	SINTHORN TOWER	WIRELESS	700	0	1
10	UNITED CENTER	SILOM	750	1	1
11	VANISSA	CHIDLOM	600	1	1
12	CHARN ISARA II	NEW PETCHABURI	490	0	0
13	GLAS HAUS	SUKUMVIT 25	650	1	0
14	GRAND AMARIN	PETCHABURI	575	1	0
15	GREEN TOWER	RAMA IV	850	1	0
16	MONTEREY TOWER	PETCHABURI	750	1	0
17	ORIFLAME	ASOKE	650	1	0
18	PACIFIC PLACE II	SUKUMVIT	575	1	0
19	QH OFFICE BUILDING II	ASOKE	500	1	0
20	TARAROM BUS TOWER	PETCHABURI	550	1	0
21	BOONPONG	PHAOLYOTHIN	550	1	0
22	GYPSUM METROPOLITAN	SRI-AYUDHAYA	525	1	0
23	SIRIPHINYO BLDG	SRI-AYUDHAYA RD.	575	1	0
24	SUNTOWERS	VIBHAVADEE	625	1	0
25	MUANG THAI PATARA	RACHADAPISEK	610	1	0
26	OLYMPIA THAI TOWER	RACHADAPHISEK	650	0	0
27	BANGNA THANI	BANGNA-TRAD	425	0	0
28	JITT-UTHAI	RAMKHAMHANG	450	1	0
29	KULAB BUILDING	BANGNA TRAD	460	1	0
30	LPN TOWER	RAMA III	575	0	0
31	NATION TOWER II	BANGNA TRAD	430	1	0
32	PHAIROJKIJJA	BANGNA-TRAD	525	1	0
33	PANJATHANI	RAMA III	575	1	0
34	THE MALL OFFICE TOWER	NGAMWONGWAN	375	0	0
35	THE WATERFORD TOWER	BANGNA-TRAD	450	1	0
36	THONGKHAM MINI OFFICE AND TOWER	NA RANONG	370	0	0

NO	NAME	LOCATION SUKHUMVIT	DISTANCE FROM CBD (KM)	DENSITY	NO. OF STORIES
1	BUBHAJIT	0	0.2	3.9	16
2	HARINTHORN TOWER	0	0.2	3.1	18
3	BISCO TOWER	0	0.9	3.9	19
4	LUMPINI TOWER	0	0.95	8.8	38
5	PLOENCHIT TOWER	0	2.05	6.2	22
6	SATHORN CITY TOWER	0	1	11.4	32
7	SATHORN SIAM CENTER	0	0.76	3.9	20
8	SETHIWAN TOWER	0	0.86	2.7	20
9	SINTHORN TOWER	0	1.43	5.7	22
10	UNITED CENTER	0	0	7.6	50
11	VANISSA	0	2.2	5.3	25
12	CHARN ISARA II	1	11.2	6.5	35
13	GLAS HAUS	1	5.57	5.5	16
14	GRAND AMARIN	1	6.08	4.6	32
15	GREEN TOWER	1	5.82	5.4	24
16	MONTEREY TOWER	1	9.83	4.5	20
17	ORIFLAME	1	6.78	8.5	34
18	PACIFIC PLACE II	1	3.65	6.5	31
19	QH OFFICE BUILDING II	1	7.65	5.5	22
20	TARAROM BUS TOWER	1	11.56	6.3	20
21	BOONPONG	0	4.4	4.6	24
22	GYPSUM METROPOLITAN	0	2.3	6	26
23	SIRIPHINYO BLDG	0	2.8	3.6	18
24	SUNTOWERS	0	7.97	7.5	36
25	MUANG THAI PATARA	0	9.3	4.6	35
26	OLYMPIA THAI TOWER	0	9.76	2.9	23
27	BANGNA THANI	0	17.5	2	19
28	JITT-UTHAI	0	18.75	1.6	14
29	KULAB BUILDING	0	22	2.3	14
30	LPN TOWER	0	6.25	6.4	17
31	NATION TOWER II	0	21.5	3.6	44
32	PHAIROJKIJJA	0	20	5.6	21
33	PANJATHANI	0	8.75	7.3	32
34	THE MALL OFFICE TOWER	0	23	7.8	19
35	THE WATERFORD TOWER	0	17.08	6.8	22
36	THONGKHAM MINI OFFICE AND TOWER	0	4.58	6.2	28

NO	NAME	SPORTS FACILITIES	BUSINESS CENTER
1	BUBHAJIT	0	0
2	HARINTHORN TOWER	0	0
3	BISCO TOWER	0	0
4	LUMPINI TOWER	0	0
5	PLOENCHIT TOWER	0	0
6	SATHORN CITY TOWER	1	0
7	SATHORN SIAM CENTER	0	0
8	SETHIWAN TOWER	0	0
9	SINTHORN TOWER	0	0
10	UNITED CENTER	1	0
11	VANISSA	0	0
12	CHARN ISARA II	1	1
13	GLAS HAUS	0	0
14	GRAND AMARIN	1	0
15	GREEN TOWER	0	0
16	MONTEREY TOWER	1	0
17	ORIFLAME	0	0
18	PACIFIC PLACE II	0	0
19	QH OFFICE BUILDING II	0	0
20	TARAROM BUS TOWER	0	1
21	BOONPONG	1	1
22	GYPSUM METROPOLITAN	0	0
23	SIRIPHINYO BLDG	0	0
24	SUNTOWERS	0	0
25	MUANG THAI PATARA	1	0
26	OLYMPIA THAI TOWER	0	1
27	BANGNA THANI	0	0
28	JITT-UTHAI	0	0
29	KULAB BUILDING	0	1
30	LPN TOWER	0	0
31	NATION TOWER II	0	0
32	PHAIROJKIJJA	0	0
33	PANJATHANI	1	0
34	THE MALL OFFICE TOWER	0	1
35	THE WATERFORD TOWER	0	0
36	THONGKHAM MINI OFFICE AND TOWER	0	0

NO	NAME	FOOD FACILITIES	HELIPORT	SHOPPING PLAZA	SUPER MARKET
1	BUBHAJIT	0	0	0	0
2	HARINTHORN TOWER	0	0	0	0
3	BISCO TOWER	1	1	0	0
4	LUMPINI TOWER	1	1	0	0
5	PLOENCHIT TOWER	0	0	0	0
6	SATHORN CITY TOWER	1	0	1	0
7	SATHORN SIAM CENTER	0	0	0	0
8	SETHIWAN TOWER	0	0	0	0
9	SINTHORN TOWER	1	1	1	0
10	UNITED CENTER	1	0	1	0
11	VANISSA	1	0	1	0
12	CHARN ISARA II	1	1	1	0
13	GLAS HAUS	1	0	0	0
14	GRAND AMARIN	1	0	0	1
15	GREEN TOWER	1	1	1	0
16	MONTEREY TOWER	1	1	0	0
17	ORIFLAME	0	1	0	0
18	PACIFIC PLACE II	0	0	0	0
19	QH OFFICE BUILDING II	1	0	0	1
20	TARAROM BUS TOWER	1	0	1	1
21	BOONPONG	1	0	1	0
22	GYPSUM METROPOLITAN	0	0	0	0
23	SIRIPHINYO BLDG	0	0	0	0
24	SUNTOWERS	1	1	1	0
25	MUANG THAI PATARA	1	0	1	1
26	OLYMPIA THAI TOWER	1	0	1	0
27	BANGNA THANI	0	0	0	0
28	IITT-UTHAI	0	0	0	0
29	KULAB BUILDING	1	0	0	0
30	LPN TOWER	0	0	0	0
31	NATION TOWER II	0	0	0	0
32	PHAIROJKIJA	1	1	0	0
33	PANJATHANI	1	1	0	0
34	THE MALL OFFICE TOWER	1	0	1	1
35	THE WATERFORD TOWER	0	0	0	0
36	THONGKHAM MINI OFFICE AND TOWER	1	0	0	0

NO	NAME	SPORTS FACILITIES	BUSINESS CENTER
1	BUBHAJIT	0	0
2	HARINTHORN TOWER	0	0
3	BISCO TOWER	0	0
4	LUMPINI TOWER	0	0
5	PLOENCHIT TOWER	0	0
6	SATHORN CITY TOWER	1	0
7	SATHORN SIAM CENTER	0	0
8	SETHIWAN TOWER	0	0
9	SINTHORN TOWER	0	0
10	UNITED CENTER	1	0
11	VANISSA	0	0
12	CHARN ISARA II	1	1
13	GLAS HAUS	0	0
14	GRAND AMARIN	1	0
15	GREEN TOWER	0	0
16	MONTEREY TOWER	1	0
17	ORIFLAME	0	0
18	PACIFIC PLACE II	0	0
19	QH OFFICE BUILDING II	0	0
20	TARAROM BUS TOWER	0	1
21	BOONPONG	1	1
22	GYPSUM METROPOLITAN	0	0
23	SIRIPHINYO BLDG	0	0
24	SUNTOWERS	0	0
25	MUANG THAI PATARA	1	0
26	OLYMPIA THAI TOWER	0	1
27	BANGNA THANI	0	0
28	JITT-UTHAI	0	0
29	KULAB BUILDING	0	1
30	LPN TOWER	0	0
31	NATION TOWER II	0	0
32	PHAIROJKIJJA	0	0
33	PANJATHANI	1	0
34	THE MALL OFFICE TOWER	0	1
35	THE WATERFORD TOWER	0	0
36	THONGKHAM MINI OFFICE AND TOWER	0	0

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